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UNIVERSITY OF ALBERTA

THE RELATIONSHIP BETWEEN METHOD OF DISCOURSE ELICITATION AND LINGUISTIC SUBGROUPS OF LEARNING DISABLED CHILDREN

BY

BARBARA WILLIAMS

A THESIS SUBMITTED TO THE FACULTY OF GRADUATE STUDIES AND RESEARCH IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF SCIENCE

IN

SPEECH-LANGUAGE PATHOLOGY

DEPARTMENT OF SPEECH PATHOLOGY AND AUDIOLOGY

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Barbara Williams

Barbara Williams
P.O. Box 2168
Vanderhoof, BC
V0J 3A0

Date: August 28 1992

UNIVERSITY OF ALBERTA

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The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies and Research for acceptance, a thesis entitled THE RELATIONSHIP BETWEEN METHOD OF DISCOURSE ELICITATION AND LINGUISTIC SUBGROUPS OF LEARNING DISABLED CHILDREN submitted by BARBARA WILLIAMS in partial fulfillment of the requirements for the degree of MASTER OF SCIENCE in SPEECH-LANGUAGE PATHOLOGY.

Phyllis Schneider

P. Schneider, Ph.D.

Paul Hagler

P. Hagler, Ph.D.

G. Bisanz, Ph.D.

Date: Aug 25, 1992

Abstract

This study looked for the presence of linguistic subgroups in a random sample of 34 learning disabled children between the ages of 6.0 and 8.6 years. Scores obtained on measures of semantics, syntax, and story retelling were subjected to cluster analysis. Seven language subtypes were derived with groups differing in performance across narrative condition. Subjects who scored high on the narrative measures in one story retelling condition did not necessarily score high on the other conditions. These results differ from results obtained by previous researchers because of the methods used to elicit the data and the measures used to analyze it. A discussion of the most appropriate methods of eliciting and analyzing story reformulations is included.

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Introduction

Children with learning disabilities are a heterogeneous population who, by definition, exhibit a discrepancy between achievement in school and predicted intellectual ability. The lack of achievement can be observed in listening, speaking, reading, writing, reasoning, or mathematical abilities (Hammill, 1990). The number of possible deficit areas and lack of specific inclusion criteria have produced a steady increase in the number of children diagnosed as learning disabled (Frankenberger & Harper, 1987). Estimates of communication disorders, specifically language disorders, in this population range from 56% (Feagans & Appelbaum, 1986) to 90.5% (Gibbs & Cooper, 1989). While language disorders are prevalent, only 6% of the learning disabled children assessed by Gibbs and Cooper (1989) were receiving speech-language pathology services and these were all in articulation. This finding suggests that a whole population of children with learning disabilities and language disorders is not being served by speech-language pathologists. One reason for this may be that conflicting results reported in the literature present questions as to the efficacy of treatment for this population (Hammill, Bryant, Brown, Dunn, & Marten, 1989).

School speech-language pathologists must be accountable for their time and thus need a means to identify children most in need of therapy. Feagans and Appelbaum (1986) suggest that learning disabled children with poor narrative discourse skills, relative to syntactic and semantic abilities, do not achieve as well in school as those with good narrative

skills. The measures used by Feagans and Appelbaum were limited in scope and were difficult and time consuming to administer. Whenever possible speech-language pathologists use standardized tests to assess children with suspected language problems. Therefore, if evidence of the same linguistic subgroups of learning disabled children (Feagans & Appelbaum, 1986) could be determined using available standardized tests in combination with time efficient narrative measures, where standardized measures are unavailable, then speech-language pathologists could justify providing treatment to those with narrative skills most needing of intervention.

Standardized tests are available for the assessment of semantic and syntactic abilities. Unfortunately this is not the case for measures of narrative ability. The best that can be done at present is to include a number of story retelling conditions in order to determine whether different conditions yield similar discourse profiles. Consequently this study will include the story retelling methodology of Feagans and Appelbaum (1986) as well as two more time efficient story retelling conditions.

This study looked for the presence of linguistic subgroups of learning disabled children using standardized measures of syntax and semantics and three methods of eliciting story reformulations.

Literature Review

The literature review is divided into three sections. A definition of learning disabilities is followed by a review of the relevant literature reported on the social, behavioral, and linguistic abilities of learning disabled children. A review of narrative discourse findings concludes this section.

Learning Disabilities

Definition

Discussion is ongoing in the literature as to the best definition of learning disability. The National Joint Committee on Learning Disabilities (NJCLD) (1988) definition is currently the most widely accepted. It reads:

> Learning disabilities is a general term that refers to a heterogeneous group of disorders manifested by significant difficulties in the acquisition and use of listening, speaking, reading, writing, reasoning or mathematical abilities. These disorders are intrinsic to the individual, presumed to be due to central nervous system dysfunction, and may occur across the life span. Problems in self-regulatory behaviors, social perception, and social interaction may exist with learning disabilities but do not by themselves constitute a learning disability. Although learning disabilities may occur concomitantly with other handicapping conditions (for example, sensory impairment, mental retardation, serious emotional disturbance) or with

> extrinsic influences (such as cultural differences, insufficient or inappropriate instruction), they are not the result of those conditions or influences (Hammill, 1990, p. 77).

Developmental nature of learning disabilities

According to the NJCLD (1988) definition, learning disabilities occur across the life span. Longitudinal studies demonstrate the co-occurrence of developmental language problems and developmental reading disorders at different ages in many children (Levi, Capozzi, Fabrizi, & Sechi, 1982; Stark, Bernstein, Condino, Bender, Tallal, & Catts, 1982; Tallal, 1988). Aram and Nation (1980) report that forty percent of the children reassessed five years after preschool identification of language impairment had residual speech and language difficulties. A further forty percent exhibited other learning problems. While early language problems do not cause subsequent reading and writing problems, they are early indications of an overall learning disability (Aram & Nation, 1980; Tallal, 1988).

Social and behavioral problems

Children with learning disabilities are often reported to have problems with social perception, social interaction, and self-regulatory behaviors (Donahue & Bryan, 1984; Feigin & Meisgeier, 1987; Goldman, 1987; Gresham & Elliott, 1987; Gresham & Reschley, 1986, McKinney & Feagans, 1984). While learning disabled children interact as frequently as normally achieving children, they reportedly engage in more negative social interactions and are perceived by teachers, parents, and peers as

having deficits in positive social behaviors (Gresham & Elliott, 1987).

When compared to their normally achieving peers, learning disabled children reportedly have less skill in decoding nonverbal communication (Bryan, 1977; Creasey & Jarvis, 1987) and are less effective at adapting messages to the needs of their listener (Knight-Arest, 1984). They also monitor conversation less and have difficulty initiating and maintaining conversation (Bryan, Donahue, & Pearl, 1981). As well, they are reported to engage in a higher proportion of off-task behaviors, are less persuasive, and are less likely to maintain the speaker role in group activities (Bryan, Donahue, & Pearl, 1981; Bryan, Donahue, Pearl, & Sturm, 1981). Off-task behaviors including poor attending skills, difficulty completing tasks, and difficulty following directions (Gresham & Reschley, 1986), contribute to poor social acceptance of learning disabled individuals by parents, teachers, and peers (Feigin & Meisgeier, 1987).

Social problems associated with learning disabilities often co-occur with linguistic difficulties. Estimates of communication disorders, specifically language disorders, in this population range from 56% (Feagans & Appelbaum, 1986) to 90.5% (Gibbs & Cooper, 1989). While language disorders are prevalent, only 6% of the learning disabled children assessed by Gibbs and Cooper (1989) were receiving speech-language pathology services and these were all in articulation. Early identification and treatment of linguistic deficits may reduce the impact of social problems in later years (Mercer, Algozzine, & Trifiletti, 1988). However, early identification is often difficult due

to the heterogeneity of the learning disabled population.

Heterogeneity/homogeneity issue

Heterogeneity of the learning disabled population is implicitly stated in the NJCLD (1988) definition (cited in Hammill, 1990). However, researchers often fail to define their subjects in such a way as to allow replication of their findings (Hammill, Bryant, Brown, Dunn, & Marten, 1989) or generalization of their results (Nye, Foster, & Seaman, 1987). The potential for variation between individuals in research samples led the Research Committee of the Council for Learning Disabilities (1984, cited in Hammill et al., 1989) to establish minimum standards for the description of subjects by learning disability researchers. These include: total number of subjects, number of male and female subjects, age of subjects, racial composition of sample, socioeconomic status of subjects, intellectual status of subjects, and relevant achievement levels of subjects. Hammill et al. (1989) found that of 277 articles reporting on learning disabilities, published in 10 professional journals, only 4 articles included descriptions of subjects with enough information to allow replication. This finding places the generalization of learning disability research in serious doubt. Consequently, many researchers are turning to subgrouping as a method of more clearly defining the specific learning disabilities exhibited by subjects in their studies (Curtiss & Tallal, 1985, cited in Tallal, 1988; Feagans & Appelbaum, 1986; Holcomb, Hardesty, Adams, & Ponder, 1987; McKinney, 1989; Wolfus, Moskovitch, & Kinsbourne, 1980).

Subgrouping

To address the heterogeneity/homogeneity issue, researchers have begun to develop methods for classifying the general learning disabled population into more homogeneous subgroups (Kavale & Forness, 1987). Theoretically, subcategories based on performance patterns across multivariate data sets should be more readily generalized to specific individuals. As well, improved diagnostic techniques should become available as sample selection procedures become more reliable (McKinney, 1984).

Subgrouping methodology

Statistical methods are available for subgrouping subjects based on the similarity of their responses across an array of variables. Clusters are produced which contain individuals with attributes more similar to each other than to those of individuals in other clusters (Kavale & Forness, 1987). These statistical techniques allow subgroup identification but Kavale & Forness (1987) warn that present subgroup classification systems are not articulated clearly enough to prevent overlap between categories. They report that 13-51% of the subjects identified in 15 subgrouping studies clustered into a subgroup showing no major deficits. Definitional problems leading to misdiagnosis and indiscriminant test instruments are two possible reasons for this result. Another reason may rest with the heterogeneity issue. Subgroupings showing no major deficit may be indicative of the heterogeneity of the sample. It is possible that those subjects identified as having no major deficits in one subgrouping study (i.e.

language) may be the subjects who presented with the most deficits in a subgrouping study involving another deficit area (i.e. mathematics). But before this argument can be considered it is necessary to show that similar subgroups are formed whenever similar abilities are measured.

To date subgroups of learning disabled children have been identified in relation to neuropsychological measures (Holcomb et al., 1987), behavior (McKinney, 1989), and language (Feagans & Appelbaum, 1986). This study specifically addresses linguistic subgroups.

Linguistic subgroups

Most research addressing linguistic subgroups has been performed on children with diagnosed language problems (Tallal, 1988; Wolfus, Moskovitch, & Kinsbourne, 1980). Wolfus, Moskovitch, & Kinsbourne (1980) divided language-impaired children into two groups: those with expressive problems and those with comprehension problems. Using the dichotomous statistical technique of discriminant analysis, it was found that the majority of the children classified with expressive problems had difficulties with production of syntax and phonology but not with comprehension of syntax and semantics. Those with the receptive deficits displayed more global syntactic and semantic impairments and performed more poorly on a variety of perceptual and linguistic tasks. This study appears to offer a neat dichotomy for classification of language-impaired children. However, this may be an artifact of the statistical techniques used to analyze the data. Discriminant function analysis was performed following subject groupings based on level of syntactic impairment and semantic ability. These groupings were based

on a priori decisions determined by theory, not on statistical techniques designed to cluster subjects based on scores from an array of variables.

Another study of children with specific language impairment identified four linguistic subgroups on the basis of standardized test performance at the time of selection into the study (Tallal, 1988). The groups were based on type and severity of language impairment as determined by differences between expressive and receptive language age scores. This study found that the group with expressive deficits outperformed the group with receptive impairments on every linguistic parameter measured through standardized testing. However, analysis of spontaneous speech samples did not produce signficant differences between the subgroups. This finding brings up the question of whether standardized tests measure the full linguistic spectrum or whether they should be used in combination with measures of discourse ability. Because results differed and because it does not seem reasonable that standardized tests are capable of adequately measuring language, it seems prudent to include both methods of assessment until the question has been answered.

The previous two studies looked for subgroups of linguistic ability within the population of children diagnosed as language-impaired. Feagans and Appelbaum (1986) looked for linguistic subgroups in a heterogeneous group of six and seven year old learning disabled children. They identified six subgroups of linguistic ability using Q-factor analysis and cluster analysis of semantic, syntactic, and

narrative discourse measures. Linguistic problems were identified in 56% of the children studied. The clusters identified were:

Cluster 1 (syntax) (16%) consisted of the children who demonstrated normal comprehension and use of a variety of syntactic structures but all other skills were below normal.

Cluster 2 (semantic) (16%) contained the children who showed superior vocabulary ability but poor skills in all other areas.

Cluster 3 (hyperverbal) (15%) contained the children who talked a lot and used a high proportion of complex sentences, but meaning and substance of the words was poor.

Cluster 4 (narrative) (27%) consisted of children with narrative skills that exceeded their syntactic and semantic skills.

Cluster 5 (superior narrative) (16%) individuals were similar to Cluster 4 with good narrative skills relative to syntactic and semantic skills but they exhibited superior narrative skills.

Cluster 6 (superior syntax and semantics) (10%) children had high syntactic and semantic skills relative to average narrative skills and story length.

Validity was determined by projecting a group of normally achieving subjects into the clusters created with the learning disabled subjects data. Evidence was found that indicated the learning disabled sample produced some distinctive clusters. The majority of the normally achieving children projected into Clusters 4 and 5 (71%) suggesting that these clusters are essentially normal linguistic patterns. This idea was further validated when the academic achievement of the learning

disabled children in Clusters 4 and 5 was examined (Feagans & Appelbaum, 1986). Over the three years of the study, the learning disabled subjects in these two clusters had fewer academic problems than their peers in the other clusters. There is no published information on the academic outcomes of the normally achieving subjects. Cluster 3 was a non-discriminating category. Twelve percent of the normally achieving subjects and 15% of the learning disabled subjects clustered into this category. The remaining 16% of the normally achieving subjects were dispersed through Clusters 1, 2, and 6, showing poor narrative skills; 42% of the learning disabled children clustered into those three categories. These learning disabled children showed the poorest academic outcomes over three years.

The results of the Feagans and Appelbaum (1986) study suggest that narrative discourse skills are crucial to academic achievement. They may also provide an explanation for the mixed results obtained in many studies of learning disabled children (Dudley-Marling, 1985; Ripich & Griffith, 1988; Roth, 1986). If subjects in a comparative study are heterogeneous with regards to the ability being measured, then individual differences will be diluted and results will not be statistically significant. The more heterogeneous a sample, the less generalizable the results. Subgroup information could provide more homogenous samples and thereby allow possible group differences to emerge.

Summary of learning disability research

A review of the literature on the linguistic issues of learning

disabilities found that learning disabilities are a heterogeneous group of developmental disorders occurring across the lifespan of an individual. Problems with social perception, social interaction, and self-regulatory behaviors may co-occur with a learning disability. Researchers report that learning disabled children have problems with decoding nonverbal communication, adapting messages to the needs of the listener, and initiation and maintenance of conversation.

The heterogeneous nature of this population has led to problems with generalization of results. Consequently, researchers have begun to study subgroups in an attempt to develop a better understanding of the specific problems exhibited by learning disabled individuals. Feagans and Appelbaum (1986) found six linguistic subgroups of learning disabled children. Those children with poor narrative discourse skills, relative to their syntactic and semantic abilities, did not achieve as well in school as those with good narrative skills. They suggest that the ability to understand and paraphrase narratives may be more important in academic functioning than vocabulary and syntax. The next section will discuss the research related to narrative discourse: narrative development; assessment; analysis techniques; and the narrative abilities of learning disabled children.

Narrative discourse

Text is a passage, spoken or written, that forms a meaningful and unified whole (Halliday & Hasan, 1976). Narrative discourse is a form of text that occurs midway between the casual oral language of conversation and formal written language. Production of narratives

involves verbalizing memories of ongoing or past experiences (Heath, 1986). Narrative competence requires mastery of the interaction between content and structure (Kemper, 1984). Sentences in a narrative must be connected to form a cohesive unit (Brown & Yule, 1983) and the speaker must be skilled at adapting the message for the audience being addressed (Van Dongen & Westby, 1986).

A variety of discourse styles is needed in order to effectively communicate at home and at school (Heath, 1986). Everyday discourse is informal and contextualized with an emphasis on the social aspects of communication. It is often child initiated. Academic settings, on the other hand, require skills in more formal, adult directed, decontextualized discourse activities (Wallach & Miller, 1988). Narrative discourse skills have considerable impact on academic achievement and success (Heath, 1986; Wallach & Miller, 1989) and may be even more important than semantic and syntactic abilities (Feagans & Appelbaum, 1986). Feagans and Appelbaum (1986) found that learning disabled children with good narrative discourse skills, relative to less developed syntactic and semantic abilities, had fewer academic problems than their peers with better syntactic and semantic abilities but poorer narrative skills.

Story telling is one type of narrative discourse. It is a complex dynamic activity requiring the integration of many different types of knowledge, including knowledge of the social world and knowledge of discourse forms and functions (Stein, 1988). Story telling overlaps both home and school environments. Therefore, analysis of children's

stories can assist clinicians in determining communicative competence (Westby, Van Dongen, & Maggart, 1989).

Narrative discourse, particularly storytelling, has been analyzed from a number of different perspectives. The following sections discuss assessment of narrative discourse skills and the various techniques used to analyze the discourse elicited.

Assessment of narrative discourse skills

Narrative discourse is a dynamic process requiring the integration of information in a dynamic way. The majority of tests used to identify language difficulties are discrete point tests. That is, they test specific factual, static information. Narrative discourse testing must capture the dynamic characteristics of the child's narration, because children who score at the average or above level on standardized discrete point tests may not demonstrate the same abilities on dynamic measures of narrative discourse (Westby, 1984).

Story retelling is the preferred method of assessment. Results obtained from tests of spontaneous storytelling are difficult to analyze and compare, and no substantial advantage has been found with story generation tasks over story retelling (Merritt & Liles, 1987). As well, interjudge reliability is stronger when a story model is present for judges. Consequently, Merritt and Liles (1987) recommend retelling rather than spontaneous story generation for the assessment of cohesion and story grammar structure.

Story grammar structure analysis

Story grammars specify the internal structure of a story,

including the individual components of the story and the rules underlying order relationships among the story components (Roth, 1986; Stein & Glenn, 1979). Story grammar structure analysis is a way of observing the hierarchical structure of stories by analyzing how the constituent categories are organized. The constituents analyzed are:

1) *Setting* which introduces the main characters, sets the stage, and provides the context for the story;

2) *Initiating event* which provides the action that changes the story environment and evokes formation of the goal or internal response; 3) *Internal response* which serves as motivation for later action;

4) *Attempt* which provides overt action or actions that are directed toward goal attainment;

5) *Consequence* which is the result of the attempt; either the attainment or nonattainment of the goal; and

6) *Reaction* which provides the emotion or ending by expressing the main character's feelings or thoughts about the generalization of the goal to some greater consequence (Stein & Glenn, 1979).

According to Glenn and Stein (1980, cited in Hedberg & Stoel-Gammon, 1986), the rules of story grammars are gradually acquired. They propose a developmental sequence for the acquisition of the constituent structures in stories. The developmental sequence consists of seven major structural patterns that vary from simple to complex with each pattern including all the categories and relationships of the previous

pattern plus one additional one.

1) The *descriptive sequence* describes the characters, the surroundings, and any habitual actions. There are no causal relationships or temporal constraints on the story;

(2) The *action sequence* places the actions in chronological order but provides no causal relations;

(3) The *reactive sequence* introduces causality. Certain changes automatically cause other changes but the characters still exhibit no goal-directed behavior;

(4) The *abbreviated episode* contains a goal although it may not be explicitly stated;

(5) The *complete episode* is developed by about six years of age. Here the child describes the entire goal-oriented behavioral sequence. The story contains a statement of the consequence and at least two of the following constituents: an initiating event, an internal response, an attempt.

(6) *Complex episodes* contain a partial or complete episode embedded in the main episode and/or multiple plans to attain the goal.

(7) The final stage is that of *interactive episodes*. By this stage the child can produce a story in which two characters influence the goals and actions of each other in a reciprocal way. This stage should be developed by about ten years of age.

Cohesive devices analysis

Cohesive devices are linguistic elements which tie a text together. They may relate elements to the text, to each other, and/or to the text as a whole. Two of the major categories of cohesive devices described by Halliday and Hasan (1976) are: (1) Reference - The use of pronominals, demonstratives, and/or comparatives that make reference to something else in the text for their interpretation; and (2) Conjunction - The use of conjunctives to connect surface structures. The conjunctive may be additive, adversative, causal, temporal, or continuative.

Presence of a cohesive device is not in itself evidence of cohesive adequacy. Cohesive devices must relate to another element in the text. Halliday and Hasan (1976) discuss text cohesion as requiring both a cohesive element and the element the cohesive device presupposes. These create a tie or relation between the elements. It is possible to have at least three kinds of ties:

1) *Complete tie* - The element referred to by the cohesive device is easily found and unambiguous.

2) *Incomplete tie* - The element referred to by the cohesive device is not provided in the text.

3) *Erroneous tie* - The cohesive device used leads the listener to erroneous information. This includes situations where two or more referents are possible choices for the meaning of the cohesive device (Liles, 1985).

Narrative discourse skills of learning disabled children

While learning disabled children present many narrative discourse skills similar to those of normally achieving age-mates, some significant differences are reported. Learning disabled children reportedly recall less factual and inferential information (Montague, Maddux, & Dereshiwsky, 1990; Roth, 1986) and have more comprehension problems (Feagans & Short, 1984; Roth, 1986). As well, they produce shorter stories which contain fewer words, fewer complex sentences (Feagans & Short, 1984), fewer complete episodes (Roth, 1986), and more non-referential pronouns (Feagans & Short, 1984). They are also less able to connect episodes with relations involving causality and simultaneity of events (Roth & Spekman, 1985, cited in Roth, 1986).

Summary of narrative discourse literature

Narrative competence requires social knowledge as well as mastery of discourse structure and form. Narrative ability is crucial to academic achievement and may be even more important than syntactic and semantic skills. Dynamic measures are used to assess narrative ability. Story telling is one such measure but the data obtained from story telling are difficult to analyze and compare across subjects. Consequently story retelling is often used instead to provide information about a child's story grammar structure knowledge and cohesion adequacy.

Learning disabled children reportedly display some significant differences in narrative discourse skills. Specifically they are reported to produce shorter stories with fewer complete episodes, more

nonreferential pronouns, and fewer causal and continuative conjunctive cohesive devices.

Statement of Problem

Language disorders are prevalent in the learning disabled population (Feagans & Appelbaum, 1986; Gibbs & Cooper, 1989) yet few learning disabled children receive speech-language pathology services (Gibbs & Cooper, 1989). Identification of linguistic subgroups may assist speech-language pathologists in determining which learning disabled children would most benefit from language treatment. Feagans and Appelbaum (1986) suggest that learning disabled children with poor narrative discourse skills, relative to syntactic and semantic abilities, do not achieve as well in school as those with good narrative skills.

The Feagans and Appelbaum (1986) study provides a good starting point for continued research into subgroups of linguistic ability in learning disabled children. Unfortunately the measures used in that study were limited in scope and were difficult and time consuming to administer. The majority were nonstandardized and lacked reliability and validity information. Standardized tests are available to assess expressive and receptive semantic and syntactic knowledge. These have at least three advantages: 1) they are widely available, 2) they can sample a wider range of semantic and syntactic knowledge than the measures used by Feagans and Appelbaum (1986), and 3) their reliability and validity are established.

The discourse elicitation method used by Feagans and Appelbaum

(1986) was a story retelling task which required subjects to demonstrate perfect nonverbal comprehension, through prop manipulation, prior to verbally retelling the story. This is a very time consuming method of discourse elicitation which does not simulate the discourse requirements of the classroom. More typically story reformulation is required immediately after stimulus presentation. Props are not always included. A pilot study conducted by this researcher found evidence supporting the use of props in a story retelling task similar to Feagans and Appelbaum (1986). Unfortunately that pilot study did not attempt to determine whether props sitting within view provided enough cues to facilitate optimum paraphrase ability or whether manipulation of props was necessary to maximize performance. Therefore, a number of story retelling conditions are necessary to determine whether different conditions yield similar discourse profiles.

Statement of Purpose

The present study was designed to determine if linguistic subgroups of learning disabled children would emerge from semantic, syntactic, and narrative discourse measures.

The questions addressed in this study were as follows:

1a. Using cluster analysis, what linguistic subgroups appear when a heterogeneous sample of learning disabled children are tested on semantic, syntactic, and narrative discourse abilities?

1b. Do any linguistic subgroup clusters obtained in Question 1a match those found by Feagans and Appelbaum (1986)?

2. Do different story retelling conditions (comprehension, visual, oral) lead to the same clusters of children when combined with measures of semantic and syntactic abilities?

Method

Subjects

The subjects were thirty-four randomly selected learning disabled children between the ages of 6.0 and 8.6 years (19 male; 15 female), from the populations identified as learning disabled and/or adaptation level within the Edmonton Public School System and the Edmonton Catholic School System. All subjects were from monolingual English speaking homes and were free of concomitant handicapping conditions. No measures of socioeconomic status were made. Subjects were included from a variety of neighborhoods throughout the city. It is the researcher's subjective opinion that the socioeconomic status of the sample ranged from low to upper middle class. A full scale IQ score of 90 or higher on the Weschler Intelligence Scale for Children - Revised was required for acceptance into this study. As well, subjects were required to pass a hearing screening immediately prior to presentation of the test battery.

Criterion for the designation of adaptation level by Edmonton Public School Board (EPSB) includes: an IQ in the dull normal to average range and academic delay of 1 year 6 months or greater when compared with chronological age (or below the 5th percentile for age) on 2 or more of the following: a) reading concepts (TERA); b) understanding school language (Boehm, Bracken, Peabody); c) quantitative concepts (WRAT, PIAT); d) visual motor integration (VMI). The same academic delay criterion is used in the EPSB definition of learning disabled. The difference between these categories is found in the intellectual

quotient requirements. Children classified as adaptation require intellectual ability in the dull normal to average range while those classified as learning disabled require an IQ score of 100 or greater. This restriction limits the category to children with intelligence quotients at the high end of the normal range. The mean score on the Weschler Intelligence Scale for Children - Revised is 100 and the standard deviation is 15; therefore the range of scores falling into the category "average intelligence" is 85 to 115. As long as the other specifications of the NJCLD (1988) definition are met then children with IQ scores above 85 should be considered learning disabled. This study required a heterogeneous sample of children with learning disabilities; therefore, subjects were drawn from both the adaptation and the learning disabled categories with exclusionary restrictions implemented in order to adhere as strictly as possible to the NJCLD definition.

Test battery

Hearing Screening

A bilateral pure tone air conduction hearing screening was completed at 20 dBHL (ANSI-1969) for 500 Hz, 1000 Hz, 2000 Hz, and 4000 Hz (ASHA, 1985).

Semantic measure

Two subtests of the Test of Language Development - Primary (2nd ed.) (TOLD-P:2) were used to assess semantic ability. These subtests provide a semantic quotient. The Picture Vocabulary Subtest assessed receptive ability and the Oral Vocabulary Subtest served as the expressive measure. In the Picture Vocabulary Subtest subjects are

required to point to one of four pictures depicting a single word spoken by the examiner. The Oral Vocabulary Subtest requires subjects to provide definitions for words provided by the examiner. The TOLD-P is a valid and reliable standardized test instrument (McCauley & Swisher, 1984).

Syntax measure

Three subtests of the Test of Language Development - Primary (2nd ed.) (TOLD-P:2) were used to assess syntactic ability. These subtests provide a syntactic quotient. The Grammatic Understanding Subtest assessed receptive ability while the Sentence Imitation Subtest and the Grammatic Completion Subtest assessed expressive ability. The Grammatic Understanding Subtest requires subjects to point to the one of three pictures depicting the sentence spoken by the examiner. The Sentence Imitation Subtest requires verbatim imitation of progressively more difficult sentence structures. The Grammatic Completion Subtest requires specific single word responses to complete sentences started by the examiner.

Narrative discourse measures

Three methods were used to elicit story reformulations from subjects with each method consisting of two trials. Six short stories were used as stimuli and three were used for practise. Length, complexity, and structure were similar across all nine stories. The stories consisted of a single episode composed of seven sentences containing an average of 12 clauses and 6 action components. The stories were adapted from Hickmann and Schneider (1991) and conform to

Stein and Glenn's (1979) description of a story grammar. See Appendix A for stories. The stories were randomly assigned to one of the three elicitation methods for each child. Each story was presented orally by the examiner. The subjects were required to retell the story into a tape recorder for later analysis. The instructions to the subjects included the suggestion that the person who would listen to the tapes was someone who did not know the story. See Appendices B and C for full descriptions of the procedures involved in task presentation.

Story retelling task - Method one - Comprehension

This story retelling task required manipulative props. The props were placed on the table in the subject's view. Following presentation of the stimulus story the subject used the props to demonstrate story comprehension. Following demonstration of perfect nonverbal comprehension the subject was asked to retell the story. See Appendix B for procedure.

Story retelling task - Method two - Visual

This story retelling task also required manipulative props. The props were placed on the table in the subject's view but were not manipulated in any way. The stimulus story was presented by the examiner and the subject immediately retold the story into the tape recorder. See Appendix C for procedure.

Story retelling task - Method three - Oral

This story retelling task did not require manipulative props. The stimulus story was presented by the examiner and the subject immediately retold the story back into the tape recorder. The procedure was

identical to that used with method two (visual) except that props were not present.

Procedure

Each subject was seen individually in a quiet room in the child's school. The hearing screening was performed first to determine the child's eligibility in the study. All subjects passed the hearing screening. Once the child was approved for inclusion, the test battery was administered. Administration of the test battery took approximately thirty-five minutes. Subjects randomly chose the order of task presentation by the roll of a dice; semantic, syntactic or discourse measures. As well, during administration of the discourse measures, the three elicitation methods were randomly presented.

All discourse measures were audiotaped and transcribed verbatim following the test session.

Scoring

Semantic and Syntax Measures

The subtests of the Test of Language Development - Primary (2nd ed.) (TOLD-P:2) were scored as defined in the Examiners Manual (Newcomer & Hammill, 1988) provided with the test. Subjects were assigned a Semantics Quotient and a Syntax Quotient as defined by the TOLD-P:2 manual.

Narrative Discourse Measures

Each story reformulation was transcribed verbatim. The number of words was counted in each transcript, according to the rules outlined in Appendix D. The resulting measure of verbal productivity was included

in the cluster analysis.

Story grammar structure analysis. The story retelling scoring procedure proposed by Merritt and Liles (1987) was used to analyze story grammar structure. Each story was analyzed for the presence of the individual story grammar components of setting, initiating event, internal response, attempt, direct consequence, and reaction as defined in Appendix E according to the procedure outlined in Appendix F (Merritt & Liles, 1987). The variable accruing from story grammar structure analysis was the number of different story grammar components used in each retelling condition. Therefore three story grammar component variables were accrued. These variables reflected awareness of the components of a story.

Episode Analysis. Each story reformulation was analyzed for evidence of the constituent structures required to qualify as a complete episode. A complete episode consists of a consequence and at least two of the following: an initiating event, an internal response, and/or an attempt. Stories were assigned the status of either complete or incomplete. The variable accruing from episode analysis was the number of complete episodes per retelling condition. Once again three variables were accrued reflecting the ability to produce complete episodes as a result of awareness of the relationship between the story grammar components.

Cohesive device analysis. The procedure for identification of cohesive markers proposed by Liles (1985) was used to analyze cohesion. A copy of this protocol is found in Appendix G. Cohesive ties were

judged for adequacy using two categories: 1) complete tie - the information referred to by the cohesive marker is easily found and defined with no ambiguity; 2. incomplete/erroneous tie - the information referred to by the cohesive marker is not provided in the text or the listener is guided to ambiguous information. The percentage of complete ties relative to the total number of ties used was computed. The variable accruing from cohesive device analysis was the percentage of complete cohesive ties used in each retelling condition. The three resulting variables reflected the ability to create cohesive text.

Scoring reliability

Intra- and interjudge reliability scores were determined. Intrajudge reliability was calculated by randomly selecting and reanalyzing 20% of the narratives. These reliability scores were 99% for transcription accuracy, 100% for story grammar components, 97% for complete cohesive ties, and 100% for episodes. Interjudge reliability was performed by a qualified speech-language pathologist. It was calculated by randomly selecting, transcribing, and analyzing 20% of the narratives. Point by point reliability was calculated for transcription (99%), complete cohesive ties (90%), and episodes (93%). Cohen's kappa was calculated for story grammar component reliability (Cohen, 1960, cited in Bakeman & Gottman, 1986). This statistic was chosen because it corrects for the chance agreements that can occur especially when coding more than one category. The interjudge reliability for story grammar components was 85% using Cohen's kappa.

Treatment of data

Cluster analysis

Cluster analysis is a descriptive technique that successively matches subjects based on the similarity of their responses across an array of variables. Several methods are available for producing clusters. The hierarchical agglomerative methods were determined to be the most suitable for this data as each subject initially represents an individual cluster and then is merged with similar subjects into nonoverlapping clusters (Aldenderfer & Blashfield, 1984). The space-dilating hierarchical agglomerative cluster analytic techniques of complete linkage and Ward's method were chosen as these methods create hyperspherical clusters which get smaller and more distinct as the number of clusters increase. Complete linkage and Ward's method use the similarity measure of squared Euclidean distance. One problem with this measure is that estimation of the similarity between cases is affected by elevation differences; variables with large size differences and standard deviations can overpower variables with smaller absolute values and standard deviations (Aldenderfer & Blashfield, 1984; Norusis, 1990). Consequently raw scores were transformed to standard scores prior to running the analyses.

Complete linkage and Ward's method differ in the way subjects are assigned to a cluster. In complete linkage, subjects join a cluster in which all variables are within a certain level of similarity to those of subjects already assigned to that cluster. In Ward's method, cases are joined that result in the minimum increase in the error sum of squares,

thereby optimizing the minimum variance within clusters (Aldenderfer & Blashfield, 1984).

No a priori assumptions were made about the number, size, or shape of the clusters to be formed. Transformed scores were subjected to both complete linkage and Ward's method of cluster analysis. Ward's method created clusters with less variability than those created by complete linkage. Complete linkage requires that all members of a cluster are within a certain level of similarity on all variables. This placed the subjects at either end of the continuum of scores into individual clusters at the beginning of the clustering process and did not allow them to join other clusters. Consequently the remaining clusters had large variances and contained subjects which were not as well matched on all variables as those created by Ward's method. Therefore, the clusters created by Ward's method are reported here.

Four cluster analyses were performed, one on the entire data set and one on each story retelling condition (oral, visual, comprehension). The 14 variables included in the entire data set cluster analysis were the standard scores derived from the Semantic Quotient, the Syntactic Quotient, and the three discourse measures, including total number of words, number of story grammar component structures, number of complete episodes, and percentage of complete cohesive ties produced in each story retelling condition. The individual story retelling condition analyses included the Semantic Quotient, the Syntactic Quotient, and the four discourse measures derived from that condition.

In order to compare differences in the clusters using the

descriptions low, average, and high, cut-offs in the mean standard scores were assigned. Standard scores for the Semantic Quotient and Syntactic Quotient were based on the normed distribution. Standard scores the the discourse measures were based on the distribution sampled in this study. Cut-offs were based on standard deviation for the measures Semantic Quotient, Syntactic Quotient, Story grammar components, and Total number of words. The descriptors and cut-offs follow: High+ > 2.0; High 1.0 to 2.0; Average -1.0 to 1.0; Low -2.0 to -1.0; Low low < -2.0. Cut-off scores for the measure Episodes were also based on standard deviation. As the maximum number of episodes possible per condition was two per subject, the standard scores were skewed on the high side when compared to the actual number of episodes produced. Consequently the following cut-off scores were used for the measure Episode: High > 2.0; Average 1.0 to 2.0; Low < 1.0. Standard deviation was not a useful indicator for cut-off scores with the measure Percentage Complete Cohesive Ties. As it was possible to achieve the maximum proportion, standard scores were not as useful with this measure. Consequently cut-off points were determined based on the distribution with High >.28; Average -.27 to .28; Low -2.0 to -.27; Low low < -2.0.

Results

This study had three goals. 1) To determine if linguistic subgroups would appear when a heterogeneous sample of learning disabled children were tested on semantic, syntactic, and narrative discourse abilities, 2) to determine if any linguistic subgroups matched those found by Feagans and Appelbaum (1986), and 3) to determine if different story retelling conditions affected cluster placement.

Cluster analysis of entire data set

The seven cluster solutions created by Ward's method were the most discriminating in all four conditions with the clusters created from the oral narrative data exhibiting the least variability. The clusters created from the entire data set were more variable than those in the oral condition largely because of differences in subject performance across narrative conditions. Figure 1 shows the seven clusters created by the entire data set. Descriptions of the clusters formed from the entire data set follow with cluster names determined by the highest scoring language skills.

Entire data set cluster 1 (Oral narrative) (9%) Subjects demonstrated their highest narrative abilities in the oral condition in combination with average semantic and low syntactic abilities (see Figure 2). These subjects were able to use language to understand and retell stories in spite of scoring poorly on standardized measures of language structure. The presence of props may have been a distracting factor for these subjects.

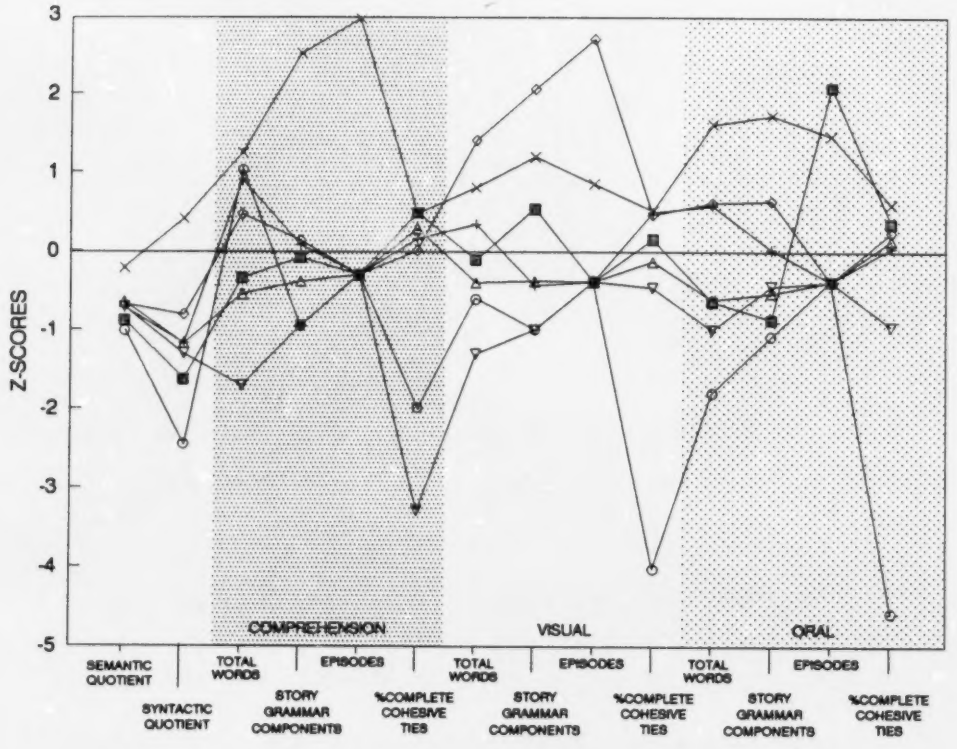

Figure 1: Entire Data Set Clusters 1-7

LEGEND

- ■ Cluster 1
- \+ Cluster 2
- ◇ Cluster 3
- △ Cluster 4
- × Cluster 5
- ▽ Cluster 6
- ○ Cluster 7

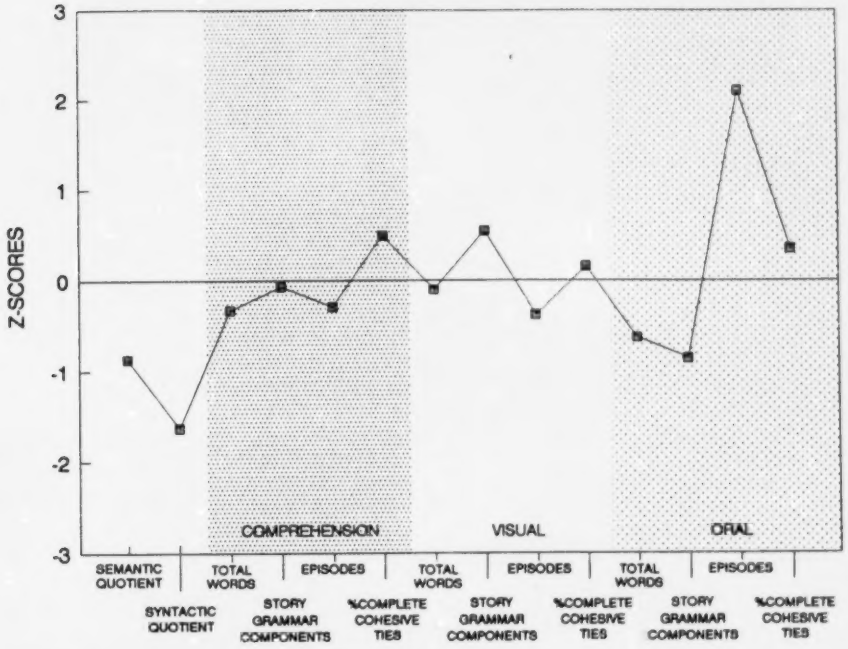

Figure 2: Entire Data Set Cluster 1

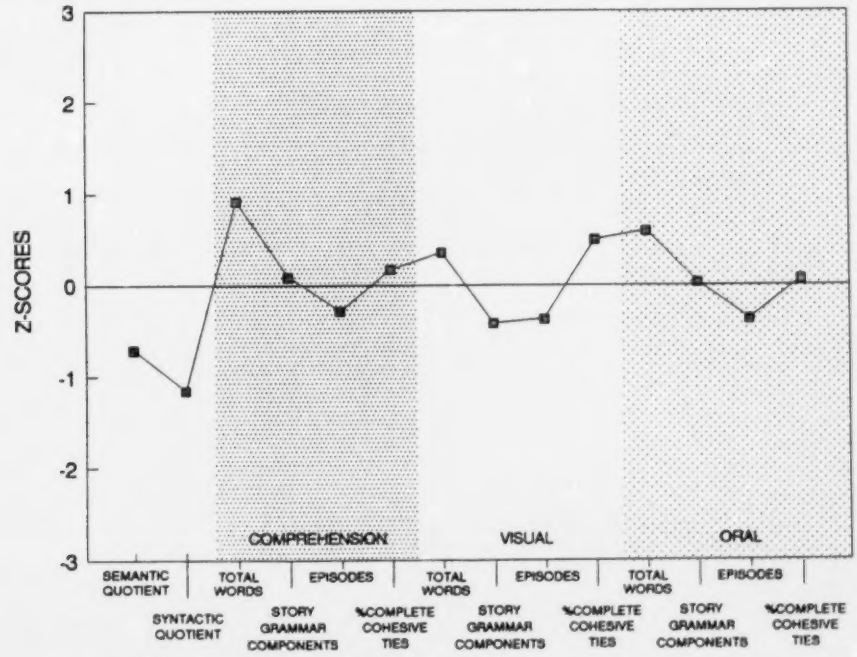

Figure 3: Entire Data Set Cluster 2

Entire data set cluster 2 (Semantic visual) (21%) Subjects demonstrated greater semantic than syntactic and narrative ability. These subjects produced stories of average length with an average number of story grammar components and average to high cohesion. No episodes were produced by the subjects in this cluster. The greatest percentage of complete cohesive ties was produced in the visual condition (see Figure 3).

Entire data set cluster 3 (Visual narrative) (9%) Subjects demonstrated their highest narrative abilities in the visual condition in combination with average semantic and syntactic abilities (see Figure 4). The memory requirements of the oral condition may have taxed the ability of these subjects.

Entire data set cluster 4 (Semantic comprehension) (44%) These subjects were similar to those in cluster 2 but they produced the greatest percentage of complete cohesive ties in the comprehension condition (see Figure 5).

Entire data set cluster 5 (Narrative Syntax) (9%) Subjects demonstrated greater syntactic than semantic ability in combination with high scores on all narrative conditions. The highest narrative scores were demonstrated in the comprehension condition (see Figure 6).

Entire data set cluster 6 (Semantics) (6%) Subjects demonstrated greater semantic than syntactic and narrative ability. Vocabulary scores exceeded the very limited scores achieved in all other language areas (see Figure 7).

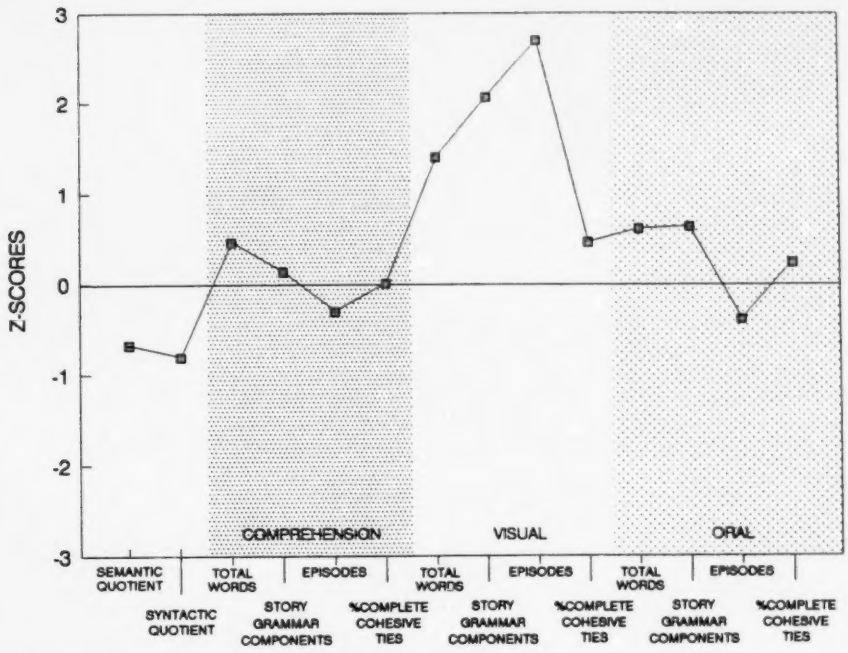

Figure 4: Entire Data Set Cluster 3

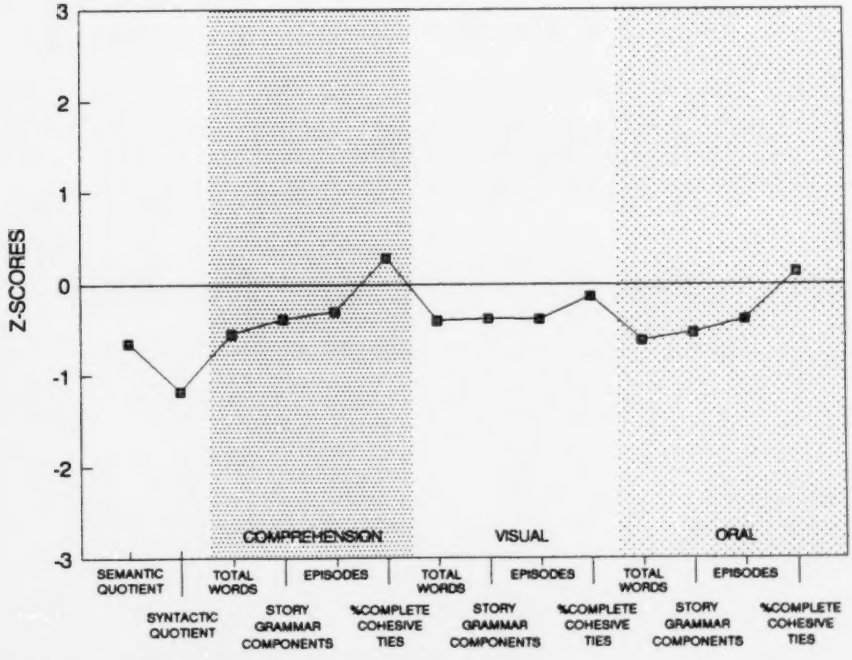

Figure 5: Entire Data Set Cluster 4

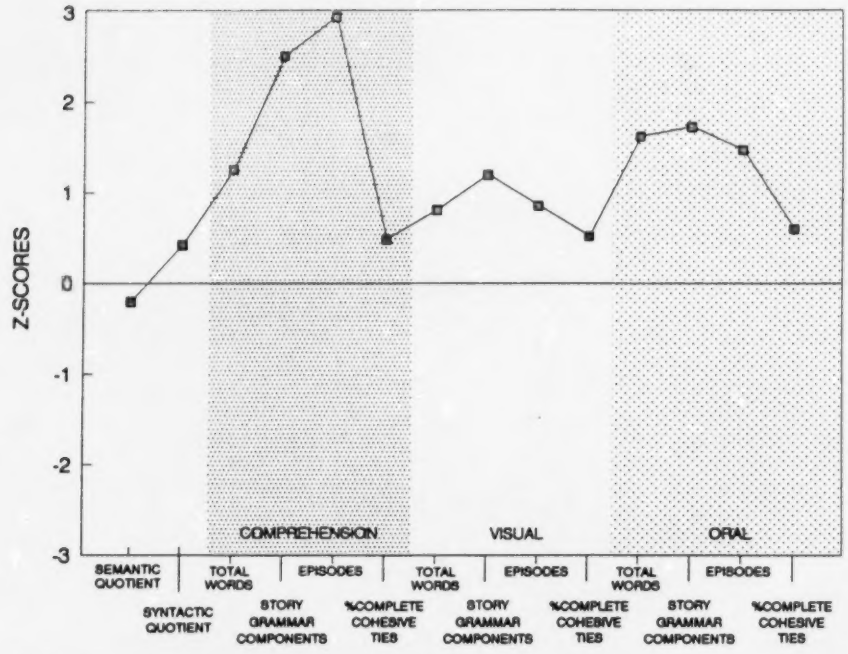

Figure 6: Entire Data Set Cluster 5

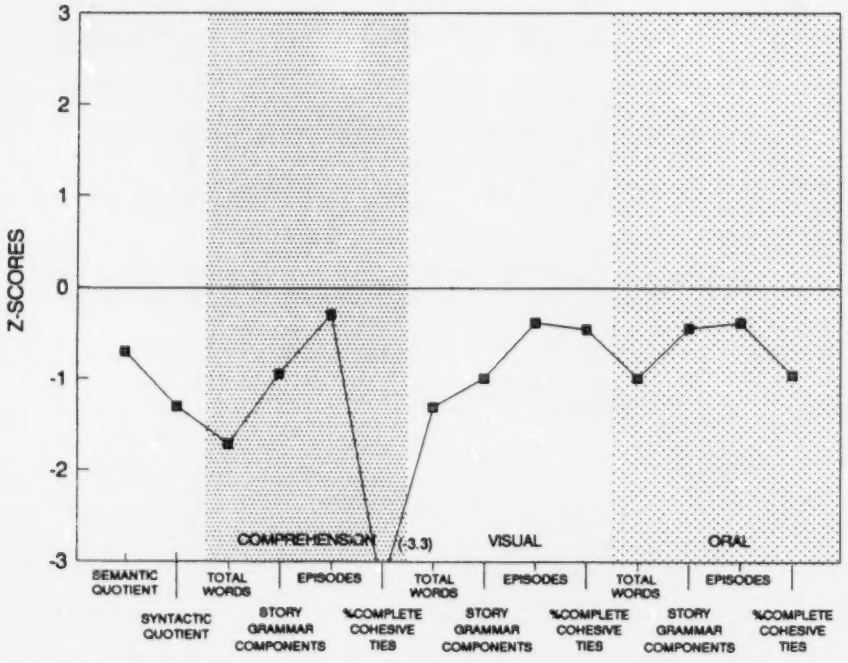

Figure 7: Entire Data Set Cluster 6

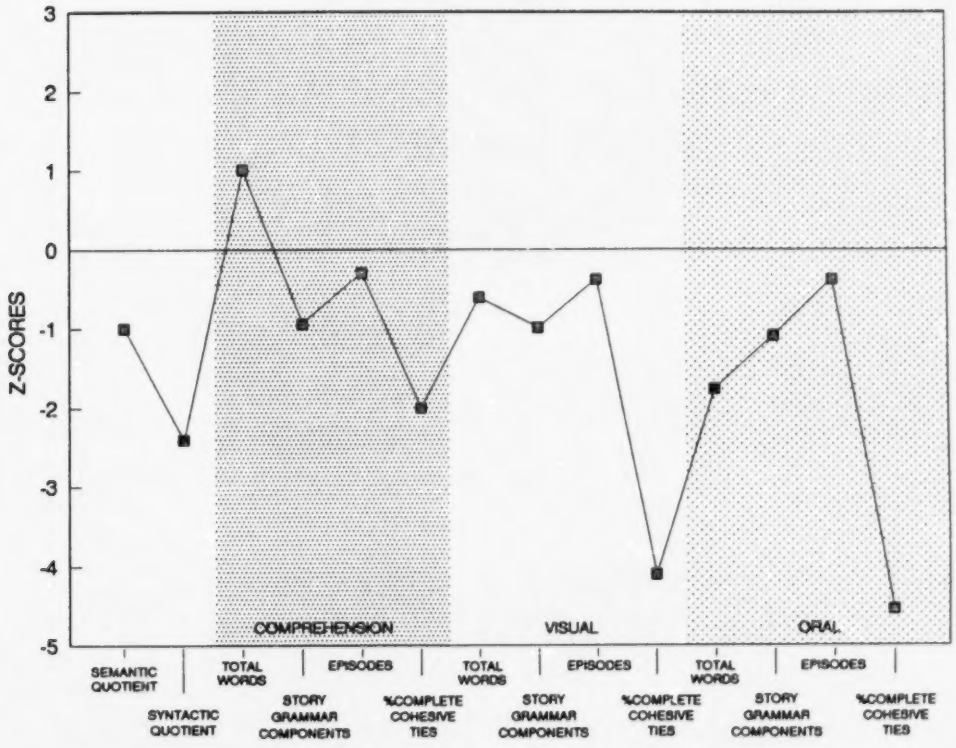

Figure 8: Entire Data Set Cluster 7

Entire data set cluster 7 (Comprehension) (3%) This subject demonstrated greater narrative ability in the comprehension condition, specifically number of words. The ability to understand and use language was severely limited as measured by both standardized and story retelling tasks (see Figure 8).

Cluster analysis of Oral condition data

Cluster analysis was also performed on subsets of the entire data set. The data from each story retelling condition, combined with the semantic and syntactic quotients, was clustered and analyzed. Individual subjects appeared in different clusters in the three conditions (see Table 1 for subject placement by condition; Table 2 for mean raw score and z-score information for clusters created in the oral condition; Table 3 for mean raw score and z-score information for clusters created in the comprehension condition; Table 4 for mean raw score and z-score information for clusters created in the visual condition). This was largely due to the narrative scores obtained by the subjects across conditions. In order to determine if the narrative conditions produced signficantly different results, a repeated measures analysis of variance (ANOVA) for each of the narrative scores across conditions was performed. None of the scores reached significance. Significance levels ranged from p=.358 to p=.955.

Visual analysis of the data showed only slight differences between conditions. More subjects produced 100% complete cohesive ties in the oral condition (13) than in the visual (11) or comprehension (10) conditions. More story grammar components were produced in the visual

condition (51 from 25 subjects) than in the comprehension (49 from 24 subjects) or the oral (47 from 23 subjects) conditions. The oral and the visual conditions both produced the same number of episodes (7) however it should be noted that there were few episodes produced in any condition. Nine subjects produced at least one episodic story in one condition; one subject in all three conditions, two subject in two conditions, and six subjects in one condition. More subjects produced stories over 100 words in the comprehension (12) and the oral (11) conditions than in the visual (7) condition.

TABLE 1. Cluster placement by method of discourse elicitation

Subject	Oral	Visual	Comp	Subject	Oral	Visual	Comp
1	1	1	1	18	2	2	2
2	2	2	2	19	4	3	3
3	3	3	2	20	3	6	1
4	2	2	1	21	2	2	2
5	4	4	3	22	3	4	2
6	2	5	1	23	2	2	2
7	5	4	4	24	3	1	2
8	2	2	2	25	7	7	4
9	6	1	1	26	6	5	1
10	1	1	5	27	6	1	1
11	2	2	6	28	3	2	2
12	3	6	4	29	5	5	6
13	3	4	4	30	6	1	5
14	2	5	1	31	3	1	5
15	3	3	7	32	2	5	1
16	3	5	1	33	3	1	1
17	6	1	5	34	1	1	2

Cluster names (clusters have been named for the highest scoring language skill):

ORAL 1) Semantic narrative; 2) Semantics syntax; 3) Variable narrative; 4) Superior narrative; 5) Low language; 6) Narrative; 7) Semantics

VISUAL 1) Cohesion; 2) Semantics syntax; 3) Narrative; 4) Hyperverbal cohesion; 5) Semantics; 6) Superior narrative; 7) Semantics

COMPREHENSION 1) Semantics syntax; 2) Semantics narrative; 3) Superior narrative; 4) Semantics hyperverbal; 5) Narrative; 6) Semantics; 7) Superior narrative

TABLE 2. Mean raw scores, mean standard scores, and descriptors for clusters formed using ORAL condition data

CLUSTER	SEMANTICS	SYNTAX	TOTAL WORDS	SGC	EPS	CD
1 n=3	Avg	Low	Avg	Avg	High	High
M raw M z	87 -0.86	76 -1.62	105 0.63	3 0.86	1.3 2.1	97 0.36
2 n=10	Avg	Avg	Avg	Low	Low	Avg
M raw M z	97 -0.22	88 -0.8	78 -0.48	.7 -0.64	0 -0.38	95 0.14
3 n=11	Avg	Avg	High	Avg	Low	High
M raw M z	90 -0.67	86 -0.90	106 1.69	2.5 0.63	0 -0.38	97 0.35
4 n=2	Avg	Avg	High	High	High	High
M raw M z	97 -0.2	103 0.2	128 1.58	5 2.17	1.5 2.41	100 0.6
5 n=2	Low	Low	Low	Low	Low	Low
M raw M z	79 -1.4	80 -1.37	59 -1.26	0 -1.09	0 -0.38	74 -1.75
6 n=5	Low	Low	Avg	Low	Low	Avg
M raw M z	83 -1.16	75 -1.83	73 -0.71	.4 -0.83	0 -0.38	95 0.10
7 n=1	Avg	Lowlow	Low	Low	Low	Lowlow
M raw M z	85 -1	64 -2.4	47 -1.76	0 -1.09	0 -0.38	42 -4.54

SGC = Story grammar components
EPS = Episodes
CD = % complete cohesive ties
M raw = mean raw score
M z = mean standard score

TABLE 3. Mean raw scores, mean standard scores, and descriptors for clusters formed using COMPREHENSION condition data

CLUSTER	SEMANTICS	SYNTAX	TOTAL WORDS	SGC	EPS	CD
1 n=11	Avg	Avg	Avg	Low	Low	Avg
M raw M z	87 -0.89	86 -0.98	72 -0.75	.4 -0.7	0 -0.29	93 0.21
2 n=10	Avg	Low	Avg	Avg	Low	High
M raw M z	96 -0.24	84 -1.06	95 0.21	1.9 0.29	0 -0.29	97 0.45
3 n=2	Avg	Avg	High+	High+	High	High
M raw M z	97 -0.2	103 0.2	120 1.26	5 2.31	1 2.16	96 0.4
4 n=4	Avg	Low	High	Low	Low	Low
M raw M z	87 -0.85	80 -1.35	126 1.5	.8 -0.45	0 -0.29	79 -0.74
5 n=4	Low	Lowlow	Avg	Avg	Low	High
M raw M z	83 -1.15	68 -2.13	90 -0.01	1.8 0.2	0 -0.29	95 0.33
6 n=2	Avg	Low	Low	Low	Low	Lowlow
M raw M z	90 -0.7	81 -1.3	48 -1.71	0 -0.94	0 -0.29	41 -3.3
7 n=1	Avg	Avg	High	High+	High	High
M raw M z	97 -0.2	113 0.87	120 1.26	6 2.96	2 4.6	100 0.66

SGC = Story grammar components
EPS = Episodes
CD = % complete cohesive ties
M raw = mean raw score
M z = mean standard score

TABLE 4. Mean raw scores, mean standard scores, and descriptors for clusters formed using VISUAL condition data

CLUSTER	SEMANTICS	SYNTAX	TOTAL WORDS	SGC	EPS	CD
1 n=10	Low	Low	Low	Avg	Low	High
M raw M z	84 -1.08	76 -1.66	86 -1.29	1.6 0.06	0 -0.38	95 0.30
2 n=8	Avg	Avg	Avg	Low	Low	High
M raw M z	100 -0.03	87 -0.9	83 -0.26	.5 -0.66	0 -0.38	98 0.46
3 n=3	Avg	Avg	Avg	High	Avg	High
M raw M z	96 -0.27	100 0.0	95 0.25	4.3 1.86	1 1.48	99 0.57
4 n=4	Avg	Avg	High	Low	Low	High
M raw M z	91 -0.6	89 -0.72	118 1.21	1 -0.33	0 -0.38	97 0.43
5 n=6	Avg	Low	Avg	Low	Low	Low
M raw M z	87 -0.87	85 -1.02	65 -0.97	.7 -0.55	0 -0.38	75 -1.16
6 n=2	Avg	Avg	High+	High+	High	High
M raw M z	87 -0.9	90 -0.7	140 2.1	5 2.3	2 3.33	98 0.5
7 n=1	Avg	Lowlow	Avg	Low	Low	Lowlow
M raw M z	85 -1	64 -2.4	74 -0.61	0 -0.99	0 -0.38	33 -4.1

SGC = Story grammar components
EPS = Episodes
CD = % complete cohesive devices
M raw = mean raw score
M z = mean standard score

Overall it appears that the seven cluster solution to the oral condition, created by Ward's method of cluster analysis, produced the tightest clusters with the least variability between the subjects in each cluster. Figure 9 shows the seven clusters created by the oral condition data. Descriptions of the oral clusters follow with cluster names determined by the highest scoring language skills.

Oral Cluster 1 (Semantic narrative) (9%) Subjects demonstrated average to high narrative ability across all the narrative measures in combination with average semantic and low syntactic abilities (see Figure 10). These subjects were able to use language to understand and retell stories in spite of scoring poorly on standardized measures of language structure.

Oral Cluster 2 (Semantics and syntax) (29%) Subjects demonstrated average semantic and syntactic abilities in combination with low to average narrative abilities. The stories produced contained an average number of words, with average cohesion but few story grammar components and no episodes (see Figure 11). These subjects were less able to use the language they demonstrated knowledge of in the standardized tests.

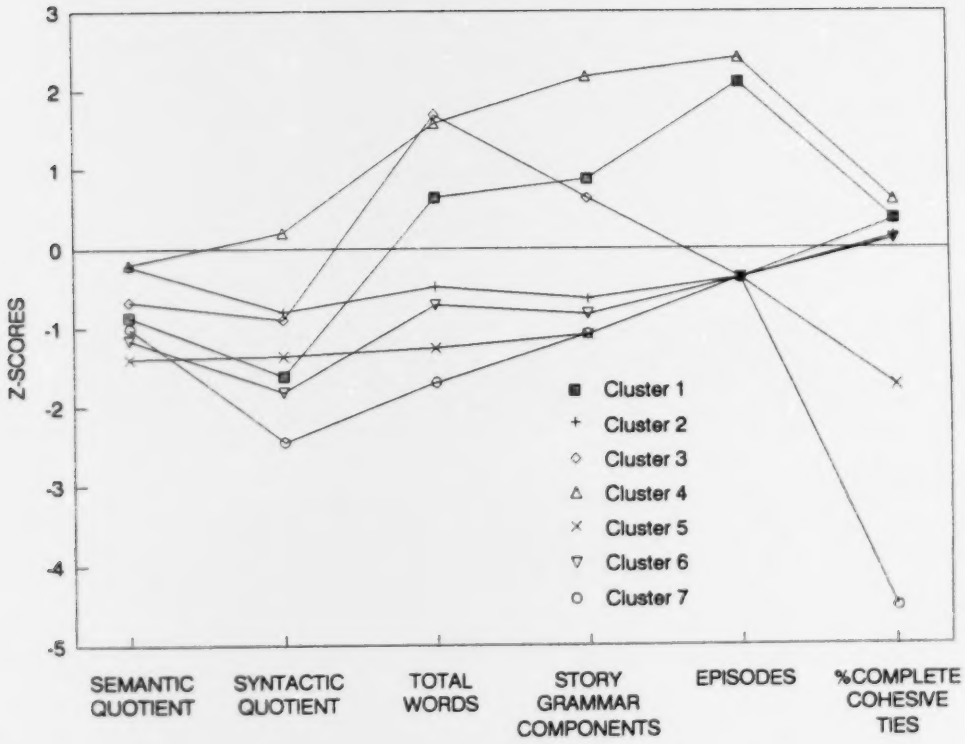

Figure 9: Oral Clusters 1-7

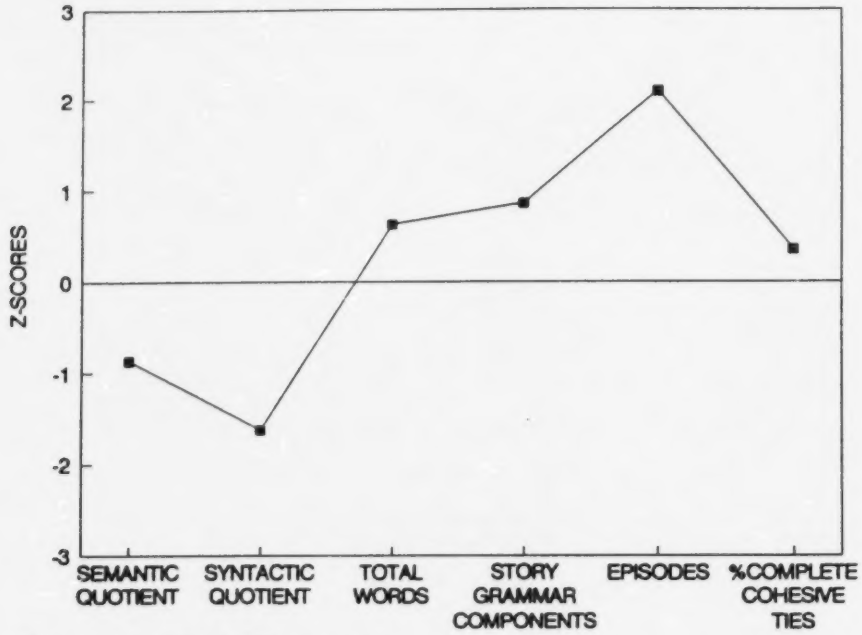

Figure 10: Oral Cluster 1

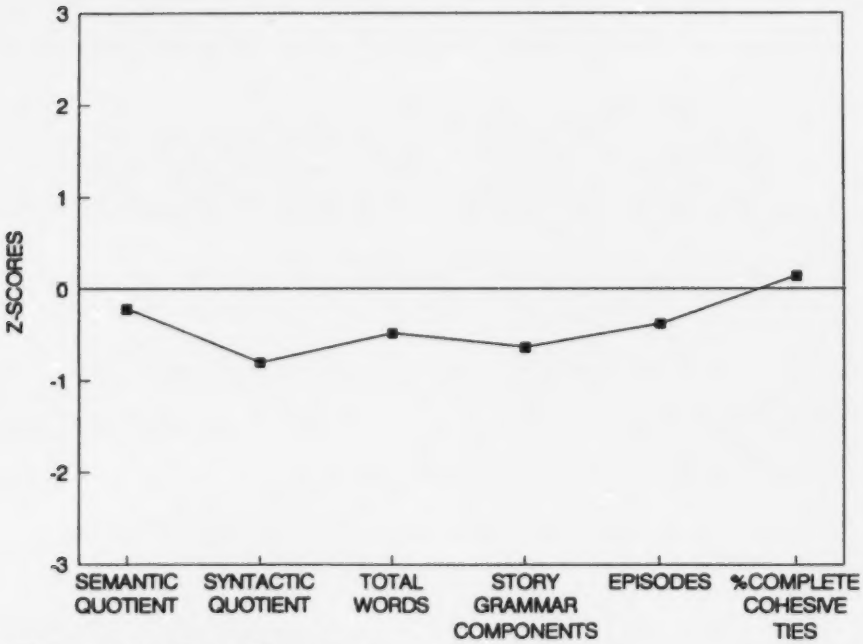

Figure 11: Oral Cluster 2

Oral Cluster 3 (Variable narrative) (32%) Subjects demonstrated a range of narrative abilities in combination with average semantic and syntactic abilities. The stories produced contained a high number of words, were highly cohesive, and contained an average number of story grammar components. However, no episodes were produced by this cluster of subjects (see Figure 12).

Oral Cluster 4 (Superior narrative) (6%) Subjects demonstrated high narrative ability on all narrative measures in combination with average semantic and syntactic abilities (see Figure 13). These subjects clearly demonstrated their ability to understand and use language.

Oral Cluster 5 (Low language) (6%) Subjects demonstrated low semantic, syntactic, and narrative discourse abilities (see Figure 14). These subjects displayed little ability to understand or use language effectively.

Oral Cluster 6 (Narrative) (15%) Subjects demonstrated narrative abilities beyond those expected by their semantic and syntactic scores (see Figure 15). These subjects produced relatively cohesive discourse using an average number of words, in spite of limited vocabulary and language structure abilities.

Oral Cluster 7 (Semantics) (3%) This subject demonstrated greater semantic than syntactic and narrative ability. Vocabulary scores exceeded the very limited scores achieved in the other language areas (see Figure 16).

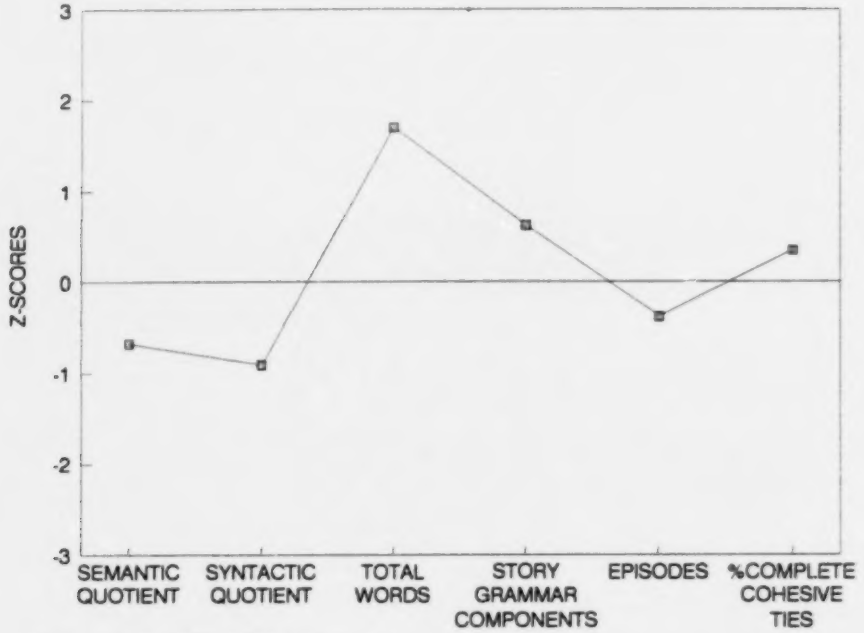

Figure 12: Oral Cluster 3

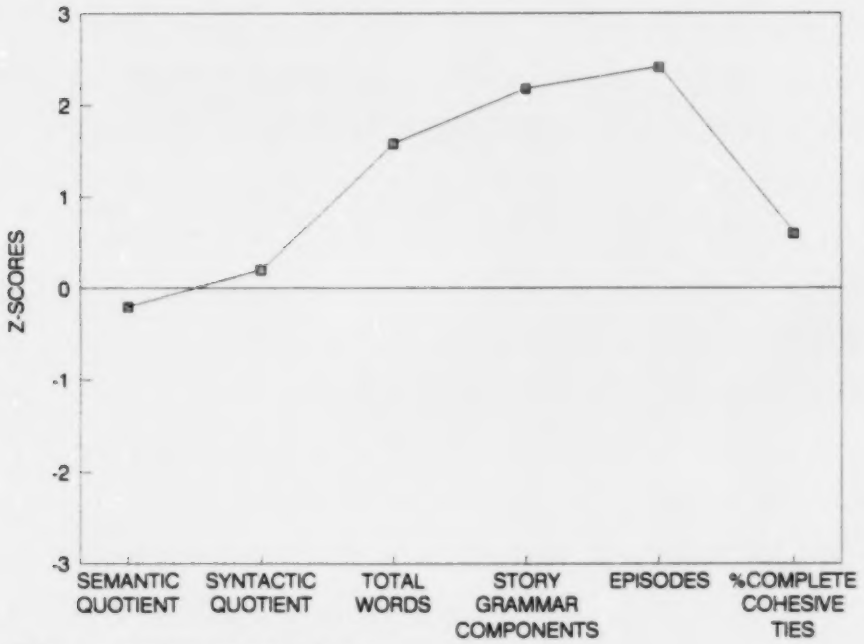

Figure 13: Oral Cluster 4

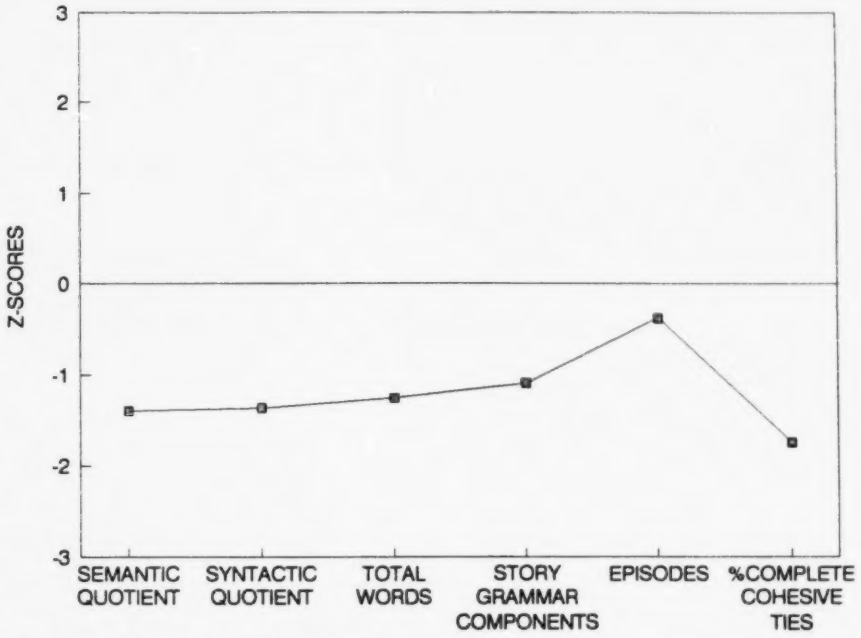

Figure 14: Oral Cluster 5

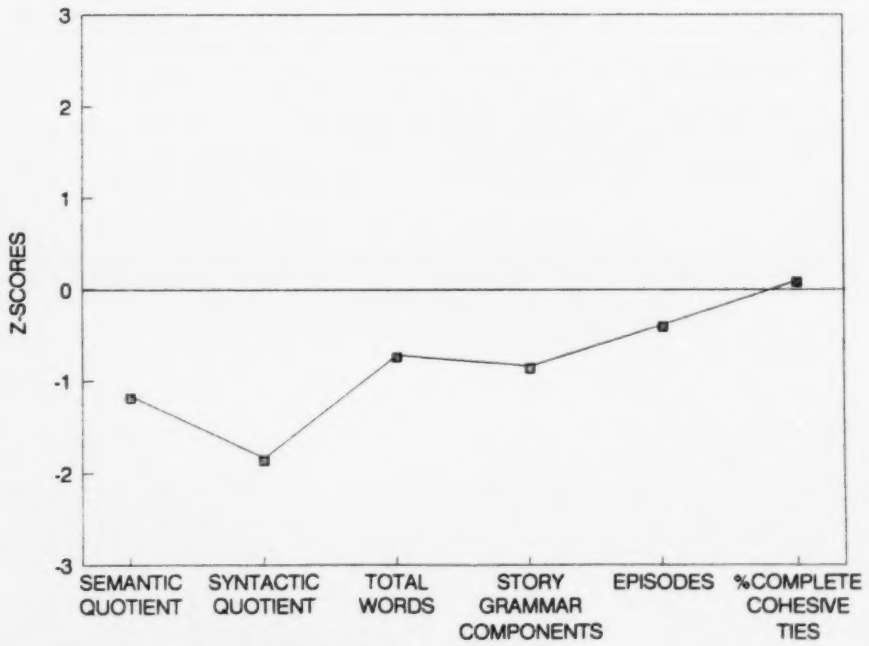

Figure 15: Oral Cluster 6

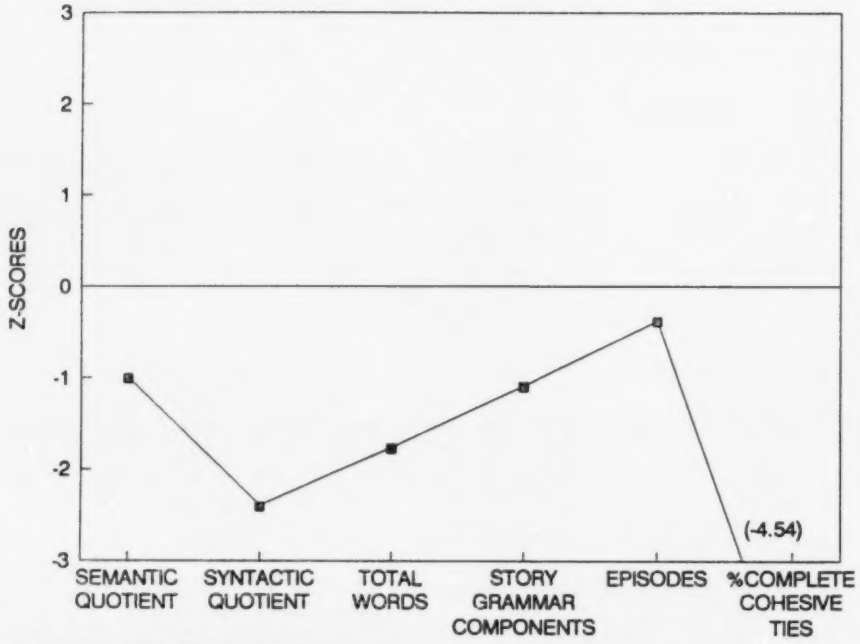

Figure 16: Oral Cluster 7

Cluster validation

In order to determine whether the clusters differed significantly on the clustering variables, a multivariate analysis of variance (MANOVA) was performed on the clustering variables (Semantic quotient, Syntactic quotient, and the narrative variables in each story retelling condition; Total words, Story grammar components, Episodes, and % complete cohesive ties). The overall MANOVA was significant, $F(5,27) = 26.35$, $p<.001$. The univariate tests were all significant ($p<.005$) except Semantics, Percent Complete Cohesive Ties in the visual condition, and Percent Complete Cohesive Ties in the oral condition.

A priori planned comparisons were performed, using a series of analyses of variances (ANOVAs), on the clusters with discrepancies between narrative and semantic or syntactic abilities. These comparisons were chosen based on the hypothesis that good narrative ability may be present in spite of poorer semantic and syntactic ability (Feagans & Appelbaum, 1986). Thus comparisons were performed on Clusters 1 vs 2, 3 vs 4, and 3 vs 6.

Cluster 1 demonstrated average to high narrative ability with average semantic and low syntactic abilities. Cluster 2 demonstrated low to average narrative abilities with average semantic and syntactic abilities. Post hoc comparisons using the Least Significant Difference Procedure found Clusters 1 and 2 significantly different on all measures except Percent Complete Cohesive Ties ($p<.05$).

Cluster 3 demonstrated a range of narrative abilities with average semantic and syntactic abilities. Cluster 4 demonstrated high narrative

ability with average semantic and syntactic abilities. Post hoc comparisons using the Least Significant Difference Procedure found Clusters 3 and 4 significantly different on the measures of Syntax, Story Grammar Components, and Episodes ($p<.05$).

Cluster 3 demonstrated a range of narrative abilities with average semantic and syntactic abilities. Cluster 6 demonstrated a range of narrative abilities with low semantic and syntactic abilities. Post hoc comparisons using the Least Significant Difference Procedure found Clusters 3 and 6 significantly different on the measures of Semantics, Syntax, Total number of words, and Story grammar Components ($p<.05$). Neither group produced any episodes.

Discussion

The findings of this study support the notion that there are linguistic subgroups of learning disabled children. A range of language ability was demonstrated on all the measures included. Semantic ability exceeded syntactic ability in this sample with only six subjects (18%) scoring less than one standard deviation below the mean on the semantic measures compared to 15 subjects (44%) on the measures of syntax. Looking specifically at the oral condition, Cluster 4 (2 subjects; 6%) demonstrated expertise in all linguistic areas. Cluster 1 (3 subjects; 9%) demonstrated average to high narrative ability. The remaining 85% displayed less narrative ability even though 61% of those subjects scored in the average range on the semantic and syntax measures. This finding supports Westby's (1984) suggestion that children may achieve average or greater scores on standardized tests and yet do less well on narrative measures.

The clusters created in this study varied somewhat from those created in the Feagans and Appelbaum (1986) study. Both studies included clusters with narrative abilities surpassing semantic and syntactic skills (this study, Cluster 4; Feagans & Appelbaum, Cluster 5), and semantic and syntactic abilities surpassing narrative abilities (this study, Cluster 2; Feagans & Appelbaum, Cluster 6). Cluster names would suggest that both studies found clusters with semantic abilities surpassing syntactic and narrative skills (this study, Cluster 7; Feagans & Appelbaum, Cluster 2). While the clusters appear similar, one major difference is apparent. The individual subject representing

Cluster 7 in this study demonstrated his greatest ability in semantics but the mean standard score (-1.0) was much less than that achieved by Cluster 2 (>1.0) in the Feagans and Appelbaum study. Cluster 7 was composed of one subject with low scores in all areas except semantics. This subject can be considered an outlier as he formed his own cluster and remained alone throughout the entire clustering process.

Cluster 3 in this study (Variable narrative) and Cluster 3 in the Feagans and Appelbaum study (Hyperverbal) are also somewhat similar. The subjects all demonstrated average semantic and syntactic abilities and produced stories with a high number of words. Feagans and Appelbaum suggest that the stories told by the subjects in their Cluster 3 were lacking substance. The measures used in this study suggest that the stories used by these subjects in Cluster 3 were highly cohesive and contained an average number of story grammar components. As no episodes were produced, it could be implied that the stories lacked substance although the high cohesion score and presence of story grammar components suggests that these subjects were not just rambling as the name Hyperverbal implies. The difference between the two groups may be more one of interpretation of results than of different subgroups of children.

One major difference between the clusters formed in the two studies rests with syntactic ability. Feagans and Appelbaum (1986) found a cluster with syntactic ability exceeding semantic and narrative abilities. The syntax measure used in their study was highly specialized. Subjects were assessed on their ability to comprehend

temporal connectives and a small number of other specialized syntactic structures. This study used standardized tests of syntax which assessed both comprehension and production of syntactic structures. The generally higher semantic and syntactic standard scores in each of the clusters created in the Feagans and Appelbaum study suggest that the standardized measures used in this study were more rigorous. None of the subjects in this study achieved semantic or syntax quotients greater than one standard deviation above the mean. Two clusters in the Feagans and Appelbaum study show mean standard scores in excess of 1.0 suggesting that more of their subjects demonstrated higher semantic and syntactic abilities. Subject selection may be another reason for this difference. The sample included in this study was drawn from the population of children identified as learning disabled or adaptation level. The IQ score requirements were more stringent than those required by Feagans and Appelbaum; 90 versus 85 respectively. The subjects in this sample ranged in age from 6.0 to 8.6 years of age compared with the six to seven year olds in the Feagans and Appelbaum study. As well, Feagans and Appelbaum included only children who had not been previously identified as needing special services. That stipulation was not included in this study. No information was obtained on previous speech and/or language treatment. Consequently the subjects in this sample may have more severe language problems than those sampled by Feagans and Appelbaum. Cluster 5 (Low language) and Cluster 6 (Narrative) in this study are examples of the severe language difficulties exhibited by these subjects. Both clusters scored more

than one standard deviation below the mean on semantic and syntactic standardized measures. That the narrative cluster (Cluster 6) was able to produce narratives with average cohesion and an average number of words adds credence to the argument that narrative ability is distinct from semantic and syntactic ability. However, the very limited vocabulary and language structure abilities still presented problems as demonstrated by the low story grammar scores and nonexistent episodes. This suggests that cohesion should not be used alone as a measure of narrative ability. Post hoc analysis of a priori planned comparisons of clusters displaying discrepancies between narrative and semantic or syntactic abilities found that none of the comparisons were significantly different on the measure Percent Complete Cohesive Ties. Clusters with low semantic and syntactic quotients (Cluster 6), average semantic and syntactic quotients (Clusters 2 and 3), and average semantic and low syntactic quotients (Cluster 1), all had Percentage Complete Cohesive Tie scores in the average to high range. The ability to produce cohesive narratives appears to be unrelated to the ability to produce story grammar components and episodes, at least in the very simple stories used as stimuli in this study. Cohesion can be thought of as a measure of structure while story grammar components and episodes are more content measures. But while cohesion may be a structural measure, it is not the same as syntax. Two clusters (2 and 6) demonstrated low syntax scores and average to high cohesion scores.

The finding that clusters differed between studies is not surprising. The measures used in the two studies were different so the

possibility exists that different language abilities were measured. Different narrative stimulus conditions may also be a large contributing factor. The clusters created from the entire data set differed based on the subjects' abilities in the different narrative conditions. Subjects who produced a story reformulation with many words, the appropriate story grammar components, a complete episode, and a high percentage of complete cohesive ties in one condition did not necessarily demonstrate those same abilities in the other two conditions. While the differences between conditions were not statistically significant, the differences between conditions within subjects is interesting.

The oral condition required more memory as there were no props to remind subjects about story grammar components. Even though the stories were very short, memory may have been a factor in the scores of some subjects. One cluster in this condition, Variable narrative, produced cohesive stories with many words and an average number of story grammar components. No episodes were produced. Memory may have played a part in this as three of the subjects in this cluster produced episodes in at least one other narrative condition.

The manipulative component of the comprehension condition may have been a confound for some subjects. As demonstration of the story occurred just prior to retelling the story, some subjects may have felt it unnecessary to present an elaborate reformulation; the examiner had just seen the story acted out. The assumption of listener knowledge may be why more subjects produced more 100% complete cohesive ties in the oral condition, more story grammar components in the visual condition,

and more episodes in the oral and visual conditions.

Only 26% of the subjects sampled produced a complete episode in any of the narrative conditions. According to Glenn and Stein (1980, cited in Hedberg & Stoel-Gammon, 1986) the complete episode is developed by about six years of age. The subjects in this sample who produced episodes ranged in age from 6.11 to 8.6 years indicating that episode production is not out of reach for children in the sampled age range. The low number of episodes coincides with Roth's (1986) finding that learning disabled children produce fewer episodes than their normally achieving peers. As this study did not have a control group it can only be speculated that normally achieving children would produce more episodes under the same conditions. Nonetheless these stories were specially designed to be one complete episode in length. Episode production in this study should have been quite easy.

Complete episodes always occurred in the presence of high cohesion scores but high cohesion scores did not predict the presence of complete episodes. This suggests that of the narrative measures used in this study, episode analysis may be the most useful for discriminating narrative ability.

Kavale and Forness (1987) report that subgrouping studies tend to find a certain percentage of subjects with no major deficits. This study was no exception. When considering the entire data set, Cluster 5 (9%) showed average or higher abilities on all language measures. When considering the data from the oral condition, Cluster 4 (6%) demonstrated the same abilities. These figures are below the 13-51%

stated by Kavale and Forness and the 44% found by Feagans and Appelbaum (1986). This suggests that the subject sample may be skewed toward language problems. This could be the result of the small sample size or it could be related to the definition of learning disabled used by the school districts sampled.

Conclusions

This study was designed to address the question of linguistic subgroups of learning disabled children. Care must be taken when generalizing from a sample containing only 34 subjects. Nonetheless, some tentative conclusions can be extended.

Clusters of subjects exhibiting different language strengths and weaknesses were found when the semantic, syntactic, and narrative measures were subjected to cluster analysis. These clusters differed somewhat from those found by Feagans and Appelbaum (1986). Different testing methods, standardized versus non-standardized semantic and syntax tests, and different methods of discourse elicitation are two possible reasons for these differences. Replication of this study is needed to determine whether the measures used produce similar clusters with different samples of learning disabled children.

The subjects in this study displayed different profiles of language ability across story retelling conditions. Consequently they were grouped into different clusters when compared on the scores obtained under the different conditions. The oral narrative condition scores created clusters with the least variability between subjects suggesting that the oral condition (no props visible) may be the most discriminating even though memory may be a confound for some subjects. The stories produced in the oral condition contained more 100% complete cohesive ties and as many episodes as the visual condition. But as more story grammar components were produced in the visual condition it would be wise to include both an oral and a visual condition in narrative

assessments. Children should be given every opportunity to present their best possible narrative for analysis. The elicitation condition which produces the best narrative may be the condition under which the individual learns the most and consequently should be taught. Assessing narrative ability in only one condition may provide misleading information while a comprehensive assessment would distinguish different performance patterns.

The measures used to analyze the story reformulations are also important. The clusters produced in this study suggest that the ability to produce cohesive text is not sufficient in itself. The finding that complete episodes always occurred in the presence of high cohesion scores but high cohesion scores did not predict the presence of complete episodes bears further investigation. Episode analysis looks very promising as a method of discerning narrative competence. An episode represents the interaction between content (story grammar components) and structure (cohesion). Narrative competence requires that interaction. Longitudinal research into the academic achievement of learning disabled children who differ in their ability to produce episodes would be interesting.

While narrative ability is important, it must not be assessed in isolation. Standardized tests of semantics and syntax are important sources of language ability information. As they have been standardized on large numbers of children, they provide a measure of the strengths and weaknesses of an individual in relation to others of the same age. Consequently they can provide insight into possible reasons why an

individual is experiencing problems with narratives. Just as narrative ability should not be assessed in isolation, standardized tests alone do not provide a comprehensive picture of a child's language ability. Many of the children in this study achieved average scores on the standardized tests and low scores on the narrative measures. Clinically, standardized semantic and syntactic measures in combination with a variety of narrative stimulus conditions would provide the most prudent language assessment at present. At the very least the narrative assessment should include an oral and a visual story retelling condition. This would allow the clinician to observe possible differences in narrative ability related to memory. If time permits a condition where nonverbal comprehension is demonstrated prior to retelling the story would round out the assessment and provide the most comprehensive picture of the child's narrative ability.

The subjects in this study were all children with documented learning difficulties. As there was no control group the range of abilities demonstrated formed the distribution for the narrative measures. This was not a problem as the data formed fairly tight clusters with significant differences present on a majority of the variables measured. However, this study would have been stronger with a control group of children without learning disabilities. It would have made possible investigation of the episode cohesion interaction and would have allowed for external validation of the clusters. Until narrative norms are established for children with normally developing language, future studies would be wise to include a control group.

This study found linguistic subgroups of learning disabled children. That the clusters created differed somewhat from those reported in previous studies suggests that more research is needed into the use of cluster analytic techniques with this population. Results differed based on the methods used to elicit the data for the cluster analysis as well as the measures used to analyze the narrative information. Cluster analysis looks promising as a method of reducing the heterogeneity of the learning disabled population, but all results obtained must be considered speculative until replication determines the reliability across more samples of learning disabled children.

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APPENDIX A: STORIES

RABBIT/BICYCLE (practise - Comprehension condition)

1. Once a rabbit lived near a school.
2. He was very tall.
3. One day he was hopping around
4. and he saw a bicycle on the ground.
5. He had nothing to do
6. and he wanted to ride the bicycle.
7. So he hopped over
8. and he climbed up on it.
9. But he was too tall
10. and he fell off.
11. The rabbit was afraid
12. but he decided to try again.
13. Finally he succeeded.
14. He was happy
15. because he could ride a bike.

DUCK/KITE (practise - Visual condition)

1. Once a duck lived by a pond.
2. He liked to play.
3. One day he was swimming in the pond
4. and he saw a kite high up in the sky.
5. He was bored
6. and he decided to see if he could catch the kite.
7. So he flew up
8. and he grabbed it in his beak.
9. But the wind caught the kite
10. and he fell down into the pond.
11. The duck was afraid
12. but he decided to try again.
13. Finally he caught the kite.
14. He was very happy
15. because he had a new toy.

MOUSE/SNOWBALL (practise - Oral condition)

1. Once a mouse lived under a tree.
2. He was very tall.
3. One day he woke up
4. and he saw a lot of snow on the ground.
5. He was curious
6. and he wanted to play in the snow.
7. So he made a snowball
8. and he put it in his pocket.
9. But the snow melted
10. and the snowball disappeared.
11. He felt silly
12. because his pants were wet.

DOG/BONE

1. Once a dog lived in a backyard.
2. He was very lazy.
3. One morning after breakfast he was walking
4. and he saw a bone.
5. He was not hungry
6. and he decided to save the bone for later.
7. So he grabbed it
8. and he ran home
9. He buried the bone in his yard.
10. Later, the dog was ready for dinner
11. but he could not remember where he buried the bone.
12. He was very hungry
13. because he had no dinner.

HORSE/CLOCK

1. One day a horse had to go to a birthday party
2. He was very excited.
3. He went shopping
4. and he found a clock.
5. He wanted to buy the clock as a birthday present.
6. So he counted his money
7. and he bought the clock.
8. Then he went home
9. and he wrapped it up.
10. But on his way to the party he tripped
11. and he broke the clock on the ground.
12. He was sad
13. because he had no present.

CAT/RACE CAR

1. Once a cat lived near a big road.
2. He was very careless.
3. One day he was walking down the road
4. and he saw a race car for sale.
5. He like to drive fast
6. and he wanted to try the race car.
7. So he got all his money
8. and he bought it.
9. But on his way home he drove very fast
10. and he smashed the race car against a tree.
11. He was very sad
12. because the race car was broken.

HIPPO/BOAT

1. Once a hippo lived near a river.
2. He was very fat.
3. One day he was resting
4. and he saw a boat on the river.
5. He wanted to cross the river
6. and he decided to use the boat.
7. So he went into the water
8. and he jumped into the boat.
9. But he was too fat
10. and the boat tipped over.
11. He felt very silly
12. because he was all wet.

FISH/COIN

1. Once a fish lived in a pond.
2. He was very poor.
3. One day he was swimming
4. and he found a coin at the bottom of the pond.
5. He was hungry
6. and he wanted to get the coin to buy some food.
7. So he dove down in the water
8. and he picked it up with his mouth.
9. But as he was swimming back up,
10. it slipped down his throat!
11. He was upset because he swallowed it
12. and he had a belly ache.

LION/CAKE

1. Once a lion lived in a big house.
2. He liked to cook.
3. One evening he made a cake for dessert
4. and he put it in the oven to bake.
5. He wondered if it was completely baked
6. and he wanted to be sure.
7. So he opened his mouth
8. and he tasted it.
9. But he was hungry
10. and he ate the whole cake.
11. He was sad
12. because he had a tummy ache.

APPENDIX B: PROCEDURE

STORY RETELLING TASK - METHOD ONE - COMPREHENSION

Seat the child across the table from the examiner.

1. Introduce the child to the toys needed to tell the story, and then ask them to name all the items displayed. Ask the child to act out some of the action sequences in the practice story narrative.

2. Once the child is familiar with the props say "I am going to tell you a story. I want you to listen carefully so that you will be able to tell the story back into the tape recorder. I have a friend who does not know this story who will listen to the tape of your story so be sure to listen carefully and tell the story so she will be able to understand it." Read the practice story to the child at a normal speaking rate. Establish eye contact during the story telling.

3. Once the story has been read ask the child to act out the story by saying "Use these toys to show me what happened in the story". If the child acts out all the action components in the story proceed to Step 4, if not, retell the story and have the child demonstrate it again. Complete this cycle until the child has acted out all the action components in the story.

4. Once nonverbal comprehension is achieved ask the child to retell the story, like this "Now I want you to tell the story back into the tape recorder. Remember my friend does not know the story so tell it as well as you can."

5. Repeat the procedure for the actual stimulus stories used for this condition.

APPENDIX C: PROCEDURE

STORY RETELLING TASK - METHOD TWO - VISUAL

Seat the child across the table from the examiner.

1. Place the props on the table in the child's view. Then instruct the child: "I am going to tell you a short story. Listen carefully because when I am finished I want you to tell it back into the tape recorder. I have a friend who does not know this story who will listen to the tape of your story so be sure to listen carefully and tell the story so she will be able to understand it."

2. Present the practice story and immediately following presentation ask the child to retell the story, like this "Now I want you to tell the story back into the tape recorder. Remember my friend does not know the story so tell it as well as you can".

3. Repeat the procedure for the actual stimulus stories used for this condition.

STORY RETELLING TASK - METHOD THREE - ORAL

Follow the procedure for Method Two - Visual but do not present any props.

Seat the child across the table from the examiner.

1. Instruct the child: "I am going to tell you a short story. Listen carefully because when I am finished I want you to tell it back into the tape recorder. I have a friend who does not know this story who will listen to the tape of your story so be sure to listen carefully and tell the story so she will be able to understand it."

2. Present the story and immediately following presentation ask the child to retell the story, like this "Now I want you to tell the story back into the tape recorder. Remember my friend does not know the story so tell it as well as you can".

APPENDIX D: RULES FOR COUNTING WORDS

1. Exact repetitions of words or phrases are not counted.
2. Unintelligible words and phrases are not counted.
3. All contractions are counted as one word.
4. Proper and compound nouns count as one word.
5. Syntactic and/or semantic revisions that did not have a complete thought are not counted.

APPENDIX E: STORY COMPONENT CRITERIA
(Merritt & Liles, 1987)

Setting Category

A statement is categorized as a SETTING if:

1. a major or minor character is introduced, *or*
2. a location is described, *or*
3. additional information is presented that conveys the habitual social context, physical context, or temporal context of the story, *or*
4. a character's habitual state is noted; the state may not have been caused by any previous occurrence, and may not cause a subsequent event to happen.

Initiating Event Category

A statement is scored as an INITIATING EVENT if it begins a goal-based episode sequence in the story and causes the main character to respond. Initiating Events include three types of information:

1. A character's action or an event.
2. Natural occurrences, which are changes in the physical environment not caused by an animate being.
3. Internal events, including a character's internal perception of an external event or, changes in the character's internal physiological state.

Setting and Initiating Events are distinguished from each other in that the Setting provides the context for the story and the Initiating Event always evokes an immediate response from the character.

Statements that are *general* events and do not lead to a goal are not scored.

Internal Response Category

A statement is characterized as an INTERNAL RESPONSE if it meets three criteria:

1. it describes the character's *psychological* state including emotions, goals, desires, intentions, or thoughts, *and*
2. it is causally related to an Initiating Event in the story, *and*
3. it leads to a plan sequence.

APPENDIX E (Cont'd)

Attempt Category

A statement is categorized as an ATTEMPT if it represents a character's overt action toward resolving the situation or achieving a goal.

There needs to be a direct causal link or enablement relation between the Attempt and either the Initiating Event or Internal Response that usually precedes it, *or* a direct causal link or enablement relation between the Attempt and subsequent Direct Consequence.

Direct Consequence Category

A statement is categorized as a DIRECT CONSEQUENCE if it marks the direct attainment or nonattainment of the character's goal and is the result of one or more Attempt statements. A Direct Consequence usually leads to a character's reaction, but this may be unstated in the story.

Direct Consequences include three types of information:

1. natural occurrences that influence the resolution of the story by facilitating or impeding attainment of the character's goal.
2. a character's action that results in either the attainment of a goal or a change in the sequence of events.
3. End States.

Reaction Category

REACTIONS define how a character feels about the attainment or nonattainment of a goal, what the character thinks about it, or an action that is emotional.

A Reaction statement is causally linked to a Direct Consequence, which is usually the preceding statement. Occasionally, a Reaction precedes a Direct Consequence, but the causal connection between the statements needs to be apparent.

Reactions usually occur at the end of an episode, but they can also be inserted at other points, for example, if a character pauses to reconsider a consequence and then proceeds.

EPISODE - Direct Consequence plus any two of the following: Initiating Event; Internal Response; Attempt.

APPENDIX F: STORY RETELLING SCORING PROCEDURE
(Merritt & Liles, 1987)

Statements elicited during the story retelling task are included in the analysis if they meet the criteria for a specific story category presented in Appendix E and if the following two conditions are met:

1. The statement must have occurred in the original story. An exact replica is not required, but the retold statement must contain the same semantic content as the first version. If details are omitted, e.g. numbers, specific times, etc., but the same story information is expressed, then the statement is scored.
2. The retold statement must express the same story information, i.e., the same story component (e.g., Initiating Event), as the original version.

Five additional general scoring procedures are also routinely followed:

1. Only one statement is scored when a child uses two or more clauses to express information that had been presented in only one statement in the original story.
2. If a child uses one clause to express information conveyed in two separate statements from the original story, and two distinct story categories are expressed, the statement is scored as both categories.
3. When a statement is expanded upon later in the retold story, or self-corrected, only the expanded/corrected version is scored.
4. Word finding errors are not penalized, e.g. "Bill" for "Jim," "bus" for "truck," "blowerthing" for "blowtorch," "hook" for "anchor," etc. (Graybeal, 1981).
5. Syntax errors, e.g., "And they dig," for "They started digging the snow," are also not penalized.

Statement are not included in the analysis if any of the following conditions are noted:

1. a general comment or question unrelated to the story,
2. repetition of a thought,
3. an unfinished statement that conveys an incomplete thought,
4. false starts,
5. formal endings,
6. unclear statements in which the information is not specific enough, irrelevant, or contradictory to the original story,

APPENDIX F (cont'd)

7. extraneous information not presented in the original story, e.g. additional conflicts, plans, etc.
8. statements that convey only part of the information in the original story. For example, "And so they got up" is not the same as, "The boys woke up frightened," as the Internal Response of fear is not conveyed.
9. statements conveying information that was assumed or implied in the original story.
10. statements presented in the wrong sequence such that a different intent and story category is expressed relative to the original story. Occasionally, a child expresses the sequence of events in an order different from the original story but consistent with the meaning of the story, for example, expressing the Initiating Event and then the Setting, or a Reaction followed by a Direct Consequence end state. These statements are scored as correct if the causal link is established. On other occasions, the sequence of events is wrong, the correct story category is expressed in the statements, but the story line is not logical. For example, a child who says, "Then they went on an island," (a Direct Consequence), and several statements later says, "But then they saw the island (an Initiating Event). The statements are not scored if this occurs because the relationship between the story parts is not appropriate.

APPENDIX G: PROCEDURE FOR IDENTIFICATION OF COHESIVE MARKERS
(adapted from Liles, 1985)

In this procedure it is important that the examiner be familiar with the original story being retold. First, read the entire narrative to get an overall sense of the text. Then read each sentence separately as a complete unit before identifying those items in the sentence that mark cohesion.

At this stage in the procedure the examiner views each sentence as isolated from the text. From this viewpoint the examiner judges an item to be a cohesive element or not under the following conditions.

1. Definition of a cohesive marker. An element is identified as a cohesive marker if its meaning cannot be adequately interpreted by the listener and if the listener must "search" outside that sentence for the completed meaning.

In addition, an element may be judged a cohesive element if it is used as a linguistic marker that leads the listener to "expect" that its interpretation is outside the sentence (e.g., definite articles).

2. Relationships within the sentence. Do not judge an item as a cohesive marker if the information referred to is recoverable within the sentence. The following are examples of information recovered within the sentence,

   Some boys took *their* car home.

Personal reference *their* refers to *boys*; therefore, the information is recoverable within the sentence.

> There was *this* scientist that had a hideout in *these* mountains where there was *this* radar tower to blow up metal things that fly in the air.

In the example above the information referred to by the use of *this* and *these* as selective demonstrative references (Halliday & Hasan, 1976, p.70) is recovered within the sentence. Thus, the examiner would not identify *this* or *these* as a cohesive marker (i.e., information recoverable outside the sentence).

APPENDIX G (cont'd)

The next example demonstrates a cohesive and a noncohesive marker in the same sentence.

One of *the* boys went home.

The demonstrative reference *the* marks which or what *boys*, and serves as a cue to the listener that the information is recoverable outside the sentence and is, therefore, cohesive. However, *one* refers within the sentence to *boys* and is not a cohesive marker.

3. Text influence on judgment. Although this procedure calls for the examiner to view each sentence as independent from the text when identifying cohesive markers, there are instances when the text must be considered. For example, in the sentence,

Marie didn't want to go on the hike.

the listener may need more information about *Marie* in order to comprehend the text. In this particular text, the listener would ask, "Who is Marie?"

Thus the decision as to whether a particular item is a cohesive marker or not is "text dependent." As texts vary specific items may vary in their cohesive function.

(a) Text influence on demonstrative reference. While *the* is a selective demonstrative reference, it may also be used in combination with words to express a unit of meaning (e.g., "*the* road," "*the* radio," "*the* newspaper"). It may be difficult to determine when the speaker intends *the* as a selective demonstrative reference or if *the* is used as an uninflected functor. To make this judgment, the examiner must take the text into consideration. For example, if the speaker used "*the* road" and the examiner judges that reference to a particular road is important within the text, he/she may judge that the speaker intended *the* to be used as a selective reference and would identify it was a cohesive marker. The following rule will facilitate this judgment:

APPENDIX G (cont'd)

If in doubt about the use of *the* because of the above reasons, do not code *the* as a selective demonstrative reference if *a* or *some* can be substituted without producing a crucial change in the meaning of the text.

Initial reference to the main character and the object must be with either the indefinite determiner (a) or the demonstrative determiner (this). Where the main character is initially introduced by the definite determiner (the), the initial reference is coded incomplete but future referents using (he) or (the) are coded complete. Where the main character is initially introduced using the personal pronoun (he), this and all future referents using (he) are coded incomplete.

4. *Two or more cohesive markers within a sentence.*
   (a) *Conjunctions.* When two or more conjunctions (e.g., *and then* or *and so then*) are conjoined in a sentence, code only one of the conjunctions as a cohesive item. Select the conjunction that is the most complex according to the following hierarchy: (1) Causal, (2) Adversative, (3) Temporal, and (4) Additive.
   (b) *Reference: Demonstrative and comparative.* When both a demonstrative and comparative reference are used (e.g., *the other*) code only as one cohesive item (comparative) rather than as two items (demonstrative and comparative).
   (c) *Reference: Personal and demonstrative.* If two or more references (i.e., either personal or demonstrative) are judged to be cohesive in the same sentence, code all markers even though they refer to a common referent, for example:

   He took *his* comic books home.

Although the sentence structure indicates that *his* refers within the sentence to *he*, there is no lexical support within the sentence to provide the listener with the information needed to know whom *his* refers. Therefore, *he* and *his* are both cohesive.

APPENDIX G (cont'd)

After the examiner has identified the cohesive markers within each sentence according to the procedure presented above, he/she then rereads the sentence with a different perspective. The markers that had been identified as cohesive are now viewed as a part of the text.

Since each cohesion marker must (or should) be tied to the information recoverable elsewhere in the text, the examiner locates the sentence containing the tied information. Then, based on the type of relationship evidenced by the tie, the examiner classifies the cohesive marker as either complete or incomplete/erroneous.